COTTON

Volume 82
Number Five
Ten Cents a Copy

MARCH, 1918

Published Monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

SPECIAL NOTICE TO TEXTILE MILL SUPERINTENDENTS!

You must make your plant produce now as it has never produced before. This is not simply for profit but is a national duty. Speed up! Get your equipment into better shape. Take condensation out of those steam heating lines. It is dragging your production down. Keep the lines clear. Many mills are using this condensation for boiler feed. If you do not have a system for handling condensation in this way you are not fulfilling your duty to your employer and to your country. A timely suggestion is to write to the Morehead Manufacturing Company of Detroit for information regarding the Morehead "back-to-boiler" system. It will pay.

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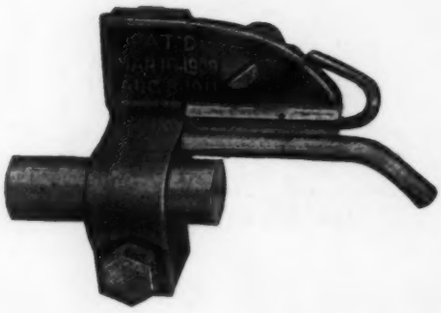

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COTTON

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L. L. ARNOLD, Editor.

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Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

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This Issue 5200 Copies.

CERTAINLY PRESIDENTS READ COTTON.

Two letters were received within a month from two mill presidents. One asked about an article published 18 months ago and the other for an article two years old. Surely the "big bosses" read COTTON—better still, they read it so thoroughly that they remember. All articles in COTTON deal with textile subjects in a practical way. They help executives make more and better goods at the same or a less price. They show how to improve working and living conditions.

SALES POSSIBILITIES IN FAR OFF CHINA.

This number of COTTON carries an interesting story of the first textile school in China. There is much food for thought for American manufacturers in this discussion. Great work is being done to educate the young Chinese to make textiles. It is especially interesting to note that the instructors were educated in the leading American textile schools and then returned home to work with *English* machinery.

China will be an important cotton textile manufacturing country. It behooves machinery and mill equipment builders to establish themselves at once. The English are already there, but the development is such that the field has only just opened. Read this article and plan for this market. It is especially interesting to note that COTTON is read regularly by the instructors and students of this school. It is also important to note that when the instructors wished to tell the story of this first Chinese school they selected COTTON for their carrier.

The advertising value of any magazine depends on the quality of the editorial pages and the class of advertisers using the magazine. Considered from this viewpoint COTTON is outranked by none.

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THE SAP IS RISING IN THE SOUTH.

In the spring the sap begins to rise with the warm sunny days. Along about this time business begins to prick up its ears. Plans that have been maturing during the long winter season are brought into the open.

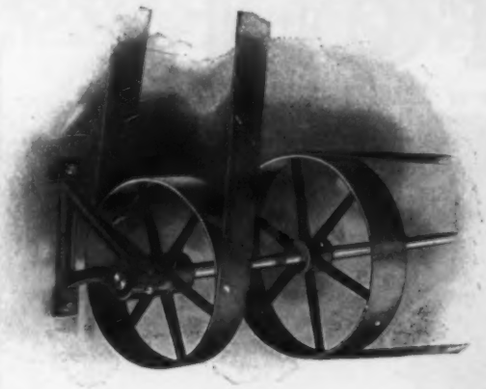
This is the busy season for salesmen and the time when they are trying to be in several places at one time. An impossibility you say, yes, if they are flesh and blood salesmen. Printed salesmen in the pages of COTTON can be in thousands of places at one time. Instead of wasting their time sitting in offices for the right man to come in, the United States Postman places them directly on the desk of the buyer.

SPECIALISTS MANUFACTURE FOR YOU, WHY NOT?

The men in your plant are specialists, each doing some certain operation in the production of the goods you sell. Each employee does one thing and does it well. You should advertise on the same basis. COTTON specializes on the cotton textile field, it is doing one thing at a time and doing it well. Place your advertisements for the cotton textile field in the medium going directly to that field. Use other mediums for other fields.

PAID FOR vs. FREE COPIES.

What you get for nothing is usually worth what it costs. Things gotten for nothing are almost always neglected. Magazines sent free of cost may be worth a great deal of money to the recipient, but they are almost always neglected and laid aside for future reference. The magazine that is bought and paid for in good hard cash always has immediate attention. The readers of COTTON buy their paper.



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Dixon's Solid Belt Dressing is put up in round bars and is easily applied by holding one end of the stick against the moving belt.

DIXON'S
SOLID BELT DRESSING

is adapted to leather, rubber and fabric belts.

In addition to increasing the clinging powers of the belt, it preserves and prolongs the life of the belt.

Write for free sample and Booklet No. 34-O.

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JOSEPH DIXON CRUCIBLE CO.

ESTABLISHED 1827.

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This is a Photo of Our Drawing of the Springstein Mills, Chester, S.C.
WE CAN MAKE A PICTURE LIKE THIS FROM THE ARCHITECTS BLUE PRINTS BEFORE PLANT IS ERECTED

RUDOLPH J. SHUTTING CO. CHATTANOOGA TENN.

JORDAN MANUFACTURING CO.,
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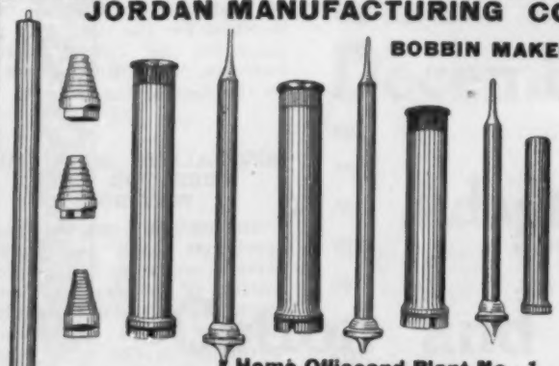

Home Office and Plant No. 1
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Hardinge "Alert"
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3	station	systems	complete...	$38.75
6	"	"	" ...	42.50
9	"	"	" ...	46.25
12	"	"	" ...	50.00
16	"	"	" ...	55.00
24	"	"	" ...	65.00
32	"	"	" ...	75.00

Labeled by National Board of Fire Underwriters and approved by Factory Mutuals: Keys do not wear out: Guaranteed unreservedly: Shipped on approval: Prompt shipment: Service that *is* Service.

HARDINGE BROS., Inc. Established 1890
First and oldest Mfrs. of portable watch clocks in America
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GARLAND

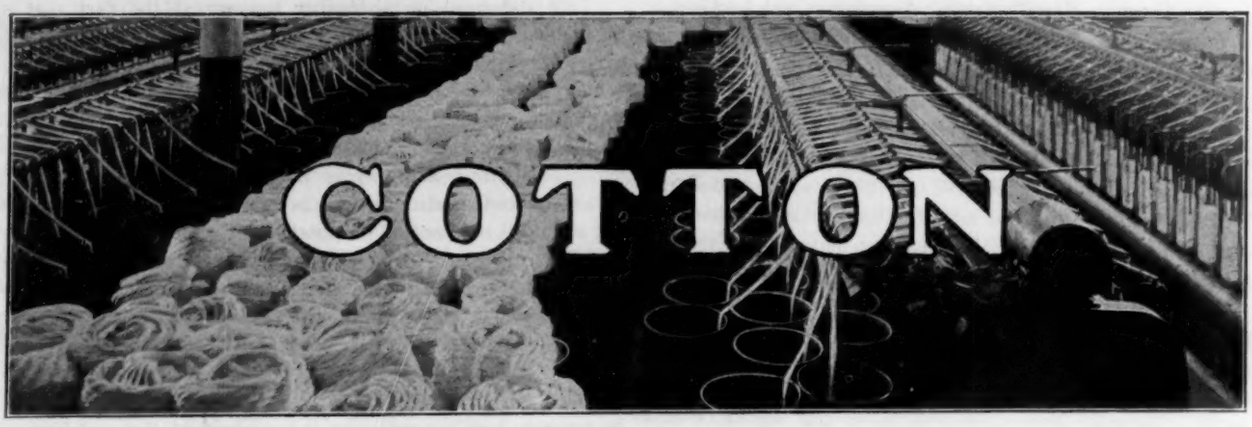
IF YOU ARE NOT QUITE SATISFIED *NOW*

Try a GARLAND Standard Grade LOOM HARNESS

No better looking, better weaving or better wearing loom harnesses can be made than those we are turning out. The best materials, great care in manufacturing and rigid inspection from the knitting to the finished harness are bound to produce harnesses of superior quality.

G TRADE MARK

GARLAND MFG. CO.
SACO, MAINE



March, Nineteen-Eighteen

Elect a War-Till-Victory Congress.

In an hour when our Nation is fighting for the principles upon which it was founded, in an hour when free institutions and the hopes of humanity are at stake, we hold it the duty of every American to take his place on the firing line of public opinion. It is not a time for old prejudices, or academic discussion at to past differences. Those who are not now for America are against America. Therefore it is a pleasure, as well as a patriotic duty, to devote this space to the following appeal to the voters of the United States issued by the League for National Unity:

"The nation must be able to count upon both parties nominating men at the forthcoming Congressional Primaries who are whole-hearted and unequivocal supporters of the war aims of our government, and its purpose to prosecute the war to a successful termination. No man ought to be nominated by either party of whom it is not certain that if elected he will support the government in its high resolve to destroy Prussian militarism and establish a just and secure peace.

"In order that the next Congress may be undividedly American and anti-Prussian it will not suffice for the nation to vote for a better man or the less disloyal of two candidates on Election Day. It will be the business of the two dominant political parties generally, whatever their natural divisions may be as to domestic policies, to ensure that whoever be elected, every American district will be represented by an American patriot. It will be disloyalty in either party to nominate or at the primaries to abet the nomination of any man whose support of the government's war program is reluctant or qualified.

"In the interest of the nation we ask for more. If in any district it become likely that an anti-war candidate be successful, it is the imperative duty of the two leading parties to effect a coalition against the non-American or anti-American candidate in order to make certain his defeat. An equitable arrangement should be effected between the two parties covering all such districts as require the expedient of coalition in order to avert the election of a disloyal candidate. A peculiar responsibility rests on parties in those districts which are preponderantly partisan, for either party is bound so to direct its affairs that the choice at the primaries, if it be equivalent to an election, shall be between absolutely loyal candidates.

"If in any Congressional or Senatorial election there prove to be danger of the election of disloyal candidates, it will become the duty of Americans, regardless of party affiliations, to defeat such candidates and to set loyalty to the nation above personal loyalty to the party.

"Let no party nominate or elect to Congress any candidate on a so-called peace platform. The American nation, under the leadership of the President of the United States, Commander-in-Chief of the Army and Navy, is for peace; but a righteous and enduring peace cannot be secured until America and the Allied Powers shall have achieved victory over the armies and governments of the Central Powers; or their peoples, having repudiated those who have been guilty of the crime of willing, initiating and carrying on the war, shall, in the interest of a just peace, have recovered their right to control their own destiny.

"A Congress must be elected which shall signify to the whole world that the American people are indivisibly united in their determination to go on with the war until its purpose shall have been accomplished. The voice of compromise must not be heard in the next Congress. Whether dominantly Republican or dominantly Democratic, the next Congress must be supremely American.

"Every member of the next Congress, whatsoever his views on domestic questions, must be a war-till-victory American.

"The pro-Germans and other seditious forces, lacking the courage of their disloyalty and hiding their treason behind the mask of pacifism, will not dare openly to frame an anti-American platform or frankly to name pro-German candidates. They will devise confusing issues. They will foment domestic strife. They will pretend to favor moderation in war and conciliation in peace. But their purpose will be to weaken the strength of our confidence in the victory of American arms and to shake our faith in the righteousness of the American aims.

"Therefore we call upon our fellow-citizens throughout the nation to use their power alike at primary and election to the end that the next Congress, Senate and House alike, prove a mighty reinforcement of the will and strength that shall crown our just cause with victory."

Label Your Factory.

The Georgia Manufacturers' Association are backing a movement that should appeal to every manufacturer in the South.

The South is not only an agricultural section and a mineral section, but an industrial section. In 1914 this section, composed of fifteen states, had 54,430 manufacturing establishments, capitalized at 2935 million dollars. These industries produced manufactured articles valued at 3101 million dollars, which were distributed even to the farthest corners of the world.

Astounding figures to those who have thought of the South merely as a cotton growing section; and this is the mental view usually suggested. Why? Because for years the Southern people have advertised their ability to grow cotton. Because every Southern port and almost every Southern railroad platform furnishes evidence in the form of bales of the white staple. Because at certain times during the year even the fields along the great network of highways announce the fact in a manner not to be denied to any except the blind.

What of the manufacturers? Ninety per cent of the factories do not even have names on them; and few of the names shown are descriptive. Except for those living or working in the vicinity, few know the names of these industries or what they manufacture. Ride on any of the "limited" trains and listen to the questions of the passengers. "What town is this?" "What factory is that?" "What does it make?" Listen to a business man describing a portion of a Southern trip! "About two hours out of Atlanta we passed through some little town (I didn't catch the name on the station) where there were two dandy mill constructed buildings and two big smoke stacks. All the same plant, I guess, and probably operated by steam. Don't know what they make or who they are, but it's a dandy plant."

Suitable advertising signs will change all this. Let every industrial plant erect a conspicuous sign that will tell not only the name of the plant, but the nature of the product. Let every wide awake chamber of commerce see that its city is properly bulletined near its main railroad stations, or at other prominent points, giving salient and easily remembered municipal facts. Let us advertise the Industrial South as we have advertised the Cotton Growing South until the world gets us suitably catalogued and listed.

Is It Necessary?

In a discussion of the recent announcement of the United States Fuel Administrator made on February 16, Charles S. Allen, secretary of the Wholesale Coal Trade Association of New York, points out that in addition to threatening the destruction of the machinery for adequately distributing the fuel supply of the country, the announcement is so misleading in the statements which it makes as to the effect on the price to the consumer that the coal interests of this community have felt it encumbent upon them to make an analysis of this announcement and point out its fallacies.

Dr. Garfield says: "Reduction in the retail prices of both anthracite and bituminous coal is expected by the U. S. Fuel Administrator to result from its decision to make the prices to coal retailers the same whether sold direct by the operators or through jobbers."

This statement is misleading because of the fact that the jobber's commission on bituminous coal, which comprises about 85 per cent of the total coal production of the country both bituminous and anthracite, is limited to fifteen cents per ton and that appears on only about 50 to 60 per cent of the total bituminous production, the remainder being sold direct and paying no jobber's commission; on anthracite coal moving to points east of Buffalo, comprising about 10 per cent of the total production of the country or 67 per cent of the anthracite production, the jobber's commission is twenty cents per ton. On the remainder of anthracite coal, which represents only about 5 per cent of the total production of the country, the commission is 25 and 30 cents per ton.

If, as Dr. Garfield says is his intention, the jobber is to be preserved as "essential to the conduct of the coal business" the sum added to the price of the coal at the mine must exceed 10 cents per ton in order for the jobber to live. As a matter of fact under present conditions it is costing many jobbers much more than 15 cents per ton to gather and distribute the coal. So it will be readily seen that the net saving to the retailer or consumer cannot exceed 5 cents per ton, if it reaches that sum.

The reference in the order of Dr. Garfield to abuses which have grown up under the present system is misleading because of the fact that such practices represent but a very, very small percentage of the coal handled. The coal business is no different from any other business in which there is always to be found a small number of persons, doing comparatively little business, who, because of that fact, are willing to take chances in evading the law. This kind of practice is not countenanced by the legitimate jobber and is so small in its extent that the statement of Dr. Garfield will lead the public to an erroneous conclusion.

The real significance to the public of this order, however, is not that a few cents per ton will be saved under its operation, but that by its operation the machinery for distribution of coal, which has been built up coincidentally with the growth of the industry, will be wrecked and this distribution may be placed largely in the hands of the same inexperienced men who have brought about the deplorable conditions which now exists with respect to fuel. It is believed that the practical business men of this nation will at once see the impracticability of the attempt on the part of the Fuel Administration to distribute the fuel supply of the country, especially when its miserable failure to do this this winter is borne in mind and the sound business man will at once see that even if the Fuel Administration called to its aid only the services of experienced coal men it would take months, if not years, to create a machine for distribution which would adequately meet the needs of the country.

All of this is aside from the question of the rights of the 2500 coal jobbers of the country who have in the neighborhood of 15,000 employees and $250,000,000 invested.

The annual convention of the Georgia Manufacturers' Association will be held at Augusta, Ga., on the 10th and 11th of April. Secretary Edw. A. Kimball has arranged an interesting program and the local entertainment committee of Augusta may be counted upon to make every spare moment a happy one. All Georgia manufacturers are invited to attend.

Verbal Contracts Do Not Protect.

BY RALPH H. BUTZ.

A large number of important business transactions occur each day in which the oral contract is relied upon as entirely sufficient. Oral contracts are usually considered sufficient where the transaction concerns promises to sell or deliver goods, and the buyer agrees to accept and pay for them. Under this form of contract the seller is the one who suffers in most instances, for he has nothing more than the buyer's mere verbal promise to fulfill certain obligations. Of course, there are cases where the buyer is the loser, for it may be impossible for him to compel delivery of the goods contracted for, through which he may sustain a loss.

The reason so many sellers still place confidence in oral contracts is probably because they have not been forced to test the validity of these contracts, or to produce sufficient evidence that a contract actually was entered into. When the buyer states that he did not enter into a contract for the purchase of goods, and the seller has no written evidence to substantiate his claim, then he will realize how hard a matter it is to present sufficient evidence to the court in proof of his claim. Even where the seller can prove that the buyer entered into an oral contract, the buyer still has many chances of escaping liability.

The importance of putting contracts into writing cannot be emphasized too much, whether they fall within the terms of the statute of frauds or not, for a written contract is absolute proof of the promises made by both parties, while the validity of an unwritten contract is in some cases not proved except after costly litigation.

The fallacy of relying upon an oral contract was demonstrated quite forcibly to the seller in the following instance:

In this case Hammond, the seller, entered into an oral contract with Blickford, the buyer, to deliver a carload of material at Blickford's warehouses. Hammond performed his part of the contract faithfully and shipped the material as agreed upon. When the car arrived at its destination the railroad company promptly notified Blickford of its arrival. Blickford refused to receive and accept the material because he discovered later on that he could purchase similar material at a reduced price. The railroad, after holding the car for some time, transferred the material to its terminal warehouses.

Hammond brought suit to recover the value of the material and to enforce Blickford to perform his part of the contract. Hammond was not allowed to recover, and the reasons given by the court will apply to thousands of other cases where oral contracts are in controversy. The court said: "While the proof shows that the defendant in this case verbally agreed to purchase the material, upon certain terms and conditions disclosed by the record, there is no evidence whatever from which a jury would be warranted to find an actual acceptance and a receipt of the material sold by the verbal contract, as would gratify the plain provisions of the statute, and would constitute a valid and enforceable contract of sale."

In order to illustrate what the court means by "actual acceptance and receipt of the material," we give below the part of the statute of frauds relating to this class of contracts. This statute has been enacted in nearly all states and in almost every instance contains similar provisions.

"A contract to sell or a sale of any goods or choses in action of the value of fifty dollars or upward shall not be enforceable by action, unless the buyer shall accept part of the goods or choses in action so contracted to be sold, or sold and actually receive the same, or give something in earnest to bind the contract, or in part payment, or unless some note or memorandum in writing of the contract or sale be signed by the party to be charged or his agent in that behalf.

"There is an acceptance of the goods within the meaning of this section when the buyer, either before or after delivery of the goods, expresses by words or conduct his assent to becoming the owner of those specified goods."

In another case in which an oral contract was involved, and in which the buyer was not bound because he did not accept the goods, the court said: "The statute does not speak of delivery, but superadds to the delivery which the common law requires, acceptance of the goods, or some part of them by the purchaser. It confers upon the buyer alone the privilege to prevent a consummation of the contract by refusing to accept and receive the goods. While there can be no acceptance under the statute without delivery by the seller, yet there must be both delivery and acceptance in order to sustain an action upon the contract. In order to satisfy the statute there must be a delivery of the goods with intent to vest the right of possession in the vendee, and there must be an actual acceptance by the latter with intent to take possession."

(Copyright, 1917, Ralph H. Butz.)

Announcement was just made that Marden, Orth & Hastings Corporation, whose head offices are located at 61 Broadway, New York, has acquired the control of the Buttercup Oil & Car Company, of Louisville, Kentucky.

The Buttercup Oil & Car Company is reported to be one of the largest producers of edible oils in the United States, and it is understood that they will continue the refining of peanut, cocoanut and cotton seed oils and other edible oils will be added to their production list. Operations were started and were in full swing early in February.

The Buttercup Company is the fortunate possessor of adequate tank car equipments which will enable it to transport its products by its own equipment, and this modern and well equipped plant has a productive capacity second to none in the country.

At a recent meeting of the stockholders of the Marden, Orth & Hastings Corporation, the capital stock was increased so as to take care of the acquisition of this property and to provide the necessary working capital for the enterprise. This news will no doubt be welcomed by the consumers of edible oil products as providing them with an additional source to meet the large increasing demand. Marden, Orth & Hastings Corporation are already well known in the oil trade, being among the largest importers and dealers of soya bean, peanut, cocoanut and other oriental and domestic oils. They operate oil converting plants in Boston, Chicago and Newfoundland, and also maintain branch offices in the two first named cities as well as at Philadelphia, Cleveland, Seattle and San Francisco.

NAN TUNG TEXTILE COLLEGE

CHINA has lagged behind the European countries and America in introducing modern textile education, a sluggishness due to the fact that she has been behind in introducing the modern textile industry. The woolen or worsted industry has been practically unknown in the country, and even today there is only one woolen mill manufacturing uniforms for the army and navy. The silk industry, which has been in existence for thousands of years, is still confined to small scale production with little or no modern machinery equipment. The cotton industry, which is supplied with the modern machinery, is of comparatively recent development in the real sense.

The establishment of textile educational institutions in Europe and in America was largely due to the strenuous efforts of a large group of the manufacturers, with the assistance of their legislative bodies, and with the desire for turning out skilled laborers; but the establishment of the same sort of an institution in China, namely, the Nan Tung Textile College, was solely due to the efforts of the officers of one cotton mill, or more strictly speaking, due to one man to whom we shall later refer. This is the only school of the kind in China offering instruction in the various processes connected with the manufacture of cotton and silk, although there are many technical schools in the various parts of the country, giving courses in textile subjects, although they are more or less semi-academic in character. This school is, then, a valuable means of industrial and economic, as well as social advancement to China. Therefore a description of the institution will, we hope, prove interesting to the readers of COTTON.

HON. CHANG CHIEN.
President and Founder of the Nan Tung Textile College, Ex-Minister of Commerce and Industry, and known by reputation as the "Cotton King of China."

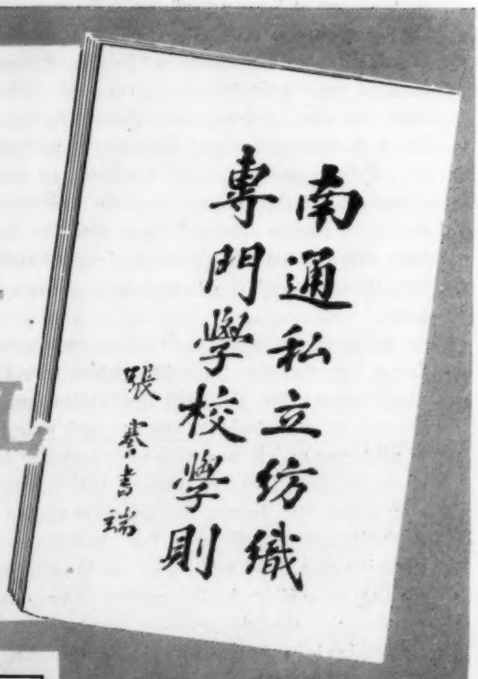
In order to understand fully the history of the school, we should study briefly the history of the Dah Sung cotton spinning and weaving mill. The school owes its origin and receives its support from this mill. The survival of the former is dependent upon the survival of the latter. For that reason the school is called the "Nan Tun Private Textile College." Let us examine some general factors that assist in making the Dah Sung Mill one of the most prosperous and one of the largest mills in China. A brief description only can be given here, in order to shed some light in connection with the establishment of the school.

The Dah Sung Mill is located in Nan Tungchow, the center of a rich cotton raising district, lying along the Yangtze River about one hundred miles from Shanghai. Cotton grown in this district can be spun as fine as 36's and it is considered one of the best cotton raising districts in China. Cotton can be purchased here from five to ten per cent cheaper than in Shanghai, due to the fact that a large number of farmers cultivate a few acres of land and sell the cotton to the mill direct. This mill was organized in 1894 with an initial capital of one million dollars, Mexican, under the leadership of Mr. Chang Chien, the founder and president of the Nan Tung Textile College. The mill was originally equipped with 22,000 spindles,

"Since the European War began China is looking for America to supply all her textile machinery"—

CHINA'S ONLY TEXTILE SCHOOL

Prepared for COTTON by B. Y. LEE



Catalog of the Nan Tung Textile College.

but later it was increased to 65,000 spindles and 550 plain looms. The machinery is made by English firms (John Hetherington and Howard and Bullough) and is still in good condition. The total assets of the mill, including buildings, land, machinery, and many other items, is over six million dollars. Another mill under practically the same ownership and control with 26,000 spindles is located at Tsunhiming, an island near the mouth of the Yangtze River.

The mill is kept running day and night with two shifts, one from 6:00 o'clock A. M. to 5:45 P. M., another from 6:00 P. M. until 5:45 next morning. The total number of operatives are 3,000, 1,500 for each shift. The mill closes four days each month for rest, not on Sundays as American mills do, but on the 2nd, 8th, 16th, and 24th of each month. The yarns spun are 12's, 16's, 20's and 22's. The average wages received by the operatives are a little lower than those in the Shanghai mills, as this district is thickly populated and the cost of living here is much lower than in many places.

The mill is closed down every year from August to September on account of the short supply of cotton. All the machinery is driven by electric power except the winding machines which are driven by hand. Coarse meals are given free to the operatives and houses for employees are rented at a very low rate. An ample supply of cotton, low scale of wages, and efficient and honest management are the factors which contribute to the prosperity and success of the mill and enable the owners to keep it running during adverse market conditions.

The average annual net profit of the mill, since it has come into existence is 300,000 dollars Mexican. About two

BEN Y. LEE.
Now Instructor at Nan Tung Textile College; Graduate of the University of Pennsylvania and the Philadelphia Textile School.

per cent of the profit is given to the mill's salaried men as a bonus and about five per cent is given to the public for philanthropic and educational purposes each year. The readers of COTTON must not be surprised to learn that all the Chinese mills are giving bonuses to their salaried men, although the system is not regular or always effective. The results obtained from the philanthropic fund can be readily seen. Nan Tungchow has become not only an industrial and educational center, but also an idealistic city in China. It has many sorts of charity institutions, such as insane asylum, orphanage, homes for dependents and aged, a home for the blind and deaf; and many public and educational institutions, such as a public park, public garden, city library, textile, medical, and agricultural colleges, normal schools for men and women, etc. All these good deeds are more or less credited to one man, who has won everlasting fame as the "Cotton King of China" and also as a philanthropist, and whose name is well known in America—Mr. Chang Chien.

During his earlier years as the promoter of the Dah Sung Mill Mr. Chang Chien met many difficulties in securing efficient management and skilled laborers for his mill. His noble attention has been deeply interested in the development of the cotton industry in China. He foresaw that in order to spread textile knowledge among the Chinese, a modern textile institution must be established, but the time was not then ripe. In the early part of April, 1912, the Nan Tung Textile College was born. At first it was a moving school in nature, corresponding somewhat to the trade apprenticeship and vocational school system in the New England states during the early part of the 19th century. A part of the iron foundry was used as the students'

dormitories and a part of the Dah Sung Mill was used for the class rooms. Mr. Wong Kee, a newly returned graduate from the Philadelphia Textile School, had been appointed as the instructor in charge. The entire teaching staff consisted of five men. The school was then in existence but without buildings or mechanical equipment. The schedule of instruction chiefly consisted of weaving, designing, spinning, mathematics, English and Chinese. The students, of course received their practice in the mill. There were two classees, the preparatory year consisting of twenty-two students and the first year regular consisting of eighteen.

After the instruction had been conducted in such fashion for a few months, the mill officers found that it was very inconvenient for the mill operatives handling their work, because of the students coming and going through the mill at all times and it was also too noisy for teachers as well as students, to give and follow the instructions. The next step taken was to remove the class rooms to the iron foundry altogether and have the students go to the mill for practice on a fixed schedule. As time passed, the reputation of the school gradually spread over the country and the number of students greatly increased. The heads of the institution then saw that the instruction schedule must be modified and enlarged or else it would be impossible to go on under the management, just as the constitution for the city of Rome could not be applied to the Roman Empire at large. During these months of thoughtful consideration, Mr. Chang Chien, the founder of the institution, had been appointed to the Ministry of Industry and Commerce, and a modern textile school was expected to become a fact. Due to the influence of Mr. Chang Chien, and the earnest desire toward the advancement of textile education for the Chinese on the part of the Dah Sung Mill officers, construction of modern buildings for the school was decided upon; and Mr. Chang Chien's longing fulfilled for a better understanding of the technical side of the textile industry in China.

Construction of the school buildings began in the early part of January, 1913, and were completed in September of the same year. The total cost for the buildings was 36,000 dollars Mex., besides 5400 dollars for the purchase of land, thus making 41,000 dollars for these two items. The first mechanical equipment of the school was as follows: 1 winding frame, 60 spindles; 1 beaming frame; 1 single cone winder, 30 spindles; 1 cast iron looming frame; 1 cast iron drawing-in frame; 1 cast iron beam stand; 9 plain looms of 40 in. reed space; 1 silk loom of 40 in. reed space; 2 twill looms of 40 in. reed space; 2 Jacquards, 400 hooks each; 1 hydraulic cloth press; 1 Witten alternating current generator; 2 Witten 3-phase switch boards; 1 Witten 3-phase motor, 25 horsepower; 1 Witten 3-phase motor, 3 horsepower, and 6 Witten 3-phase motors, ½ horsepower each.

The total cost of the equipment was £1,478 in Sterling, or 7,380 gold dollars. All the machinery was made and presented by the Howard and Bullough Company, Accrington, England, at half price. On account of their business foresight and business diplomacy, the English have won a great share of the trade in China. It is now up to American textile machinery manufacturers to follow the latter's example in order to get more Chinese trade.

When the school opened its fall term in 1913 all classes moved to the new buildings. The number of the students at this term had been increased to eighty; the number of teachers had been increased to nine; the number of classes had expanded to three; namely, preparatory, first year and second year regular. Many new courses have been added to the school program; namely, chemistry and dyeing, mechanical drawing, jacquard designing and weaving, and sciences. The school consists of three two-story modern style buildings; one for administrative office, and officers' and teachers' dormitories; a second for class rooms and the students' dormitories; and a third for mechanical equipment. It is located on the next wall of the Dah Sung Mill with an alley separating the two. Its total area is about 35 acres, one-third for buildings and two-thirds for an athletic field and recreation center. One advantage this school has over many American textile schools, is that the students can go to visit the mill any time they wish as the two are situated so near together.

The school's main desire is to instill the principles of textile manufacturing, and the middle school standard of requirements for entrance show that the primary object is to instruct the more intelligent young men who, after their graduation, can fill places of responsibility in the cotton and silk mills in China. It should be borne in mind that the standard of the Chinese middle school is somewhat higher than that in America. The number of students has increased to 130 this year, and the teachers to 20. The students come from nearly all provinces. Four teachers have graduated from Philadelphia, New Bedford and Lowell Textile Schools and three of these have also graduated from American universities. The school schedule of instruction has been copied, more or less, from American textile schools, but it is especially similar to that of the Philadelphia Textile School, because the late Mr. Wong Kee, a graduate of the last mentioned institution, was the instructor in charge. English textbooks in textile subjects, and the English language are used in the course of instruction, for the following reasons:

There are practically no textbooks on textile subjects written in Chinese. Many such books are written in Japanese, but they are of little value in comparison with those written in English. The textile terms are hard to be translated, or even when they are translated, they are not yet standardized. In order to understand what is going on in foreign countries, students should, at any rate, be able to read foreign textile magazines. Besides these, nearly every textile contrivance is either imported from England, America or Japan.

Another reason is that there are so many different dialects in China as to make it particularly hard for the teachers to give explanations in class rooms, especially explanations on textile terms. Students, too, do not speak the same dialect. The best thing to do now is to use a Chinese explanation whenever possible. Still another reason is that when students are admitted to the school they have already learned considerable English in their middle schools (in their preparatory year, the students spend sixteen hours per week in English and their first year regular, they spend eight hours) in this way they are able to speak and write fairly good English. No one can tell now when Chinese will be substituted in the course of instruction.

In early part of 1914 the following spinning machinery was added to the equipment: 1 flat carding engine; 1 drawing frame, 3 by 2; 1 slubbing frame, 28 spindles; 1

intermediate frame, 40 spindles; 1 roving frame, 64 spindles; 1 twist ring frame, 120 spindles; 1 filling twist ring frame, 120 spindles, and 1 bobbin reel, 40 hanks.

The spinning department is located on one side of the mechanical building, having the area 100 by 250 feet. The floor is cemented. A machinist from the Dah Sung Mill is constantly taking care of the machinery. Sometimes the mill sends some operatives over to run these spinning machines, both after and before the school hours during the busy season.

In the weaving department there are five plain looms made by the Saco-Lowell Shops, and one by the Toyodas Loom Works, Japan, besides those already mentioned. They are all of 40 inch reed space and the number of picks per inch being 180 on the average. This department is located with two repeats of straight through having two cords per hook and is used for silk weaving. The other 1200 hook loom is mounted with two section tie of 600 hooks in each section and is also used for silk weaving. One 400 hook loom is mounted with straight through of eight repeats and is used for cotton; the other is mounted with combination tie and is used for weaving bed spreads. One 600 hook loom is mounted with straight through tie of seven repeats and is used for silk weaving; the other is mounted with combination tie and is used for weaving table covers.

The reeds for the 1200 hook machines are imported from Japan, contain 84 dents per inch and cost fourteen yens a piece. The other four reeds are made of wood and are also imported from Japan. The course in jacquard weaving is extended to two years; the single cloth system

ONE OF THE SCHOOL BUILDINGS. THE RECITATION ROOMS ARE LOCATED ON THE FIRST FLOOR, THE SECOND FLOOR BEING DEVOTED TO STUDENTS' DORMITORIES.

on the other side on the ground floor of the mechanical building having the same area as that of the spinning department. On the second floor just above the spinning department the hand weaving department is located. There are 40 hand looms, each of which is 4 feet wide, 6 feet long and 6 feet high. Thirty two harnesses can be used in these looms. The reed space being 30 inches and the reed is made of wood. All are imported from Japan.

The jacquard department is located on the second floor just above the power weaving department. There are now six jacquard looms, including the two previously mentioned; four are imported from Japan. There are three card cutters, one fine index and two common index. Two looms have 1200 hooks each, two 600 hooks each and the remaining two 400 hooks each. One 1200 hook loom is mounted and other general information in jacquard machines are taught in the second year regular and the double cloth. system, mounting tie-ups, and designing for table covers and bed spreads, are taught in the third year regular. The card paper is also imported from Japan and costs seven yens per sheet, from which ten cards can be cut for the 600 machine or 15 for the 400 machine.

Let us now go to see the modern dye house; it is located on the ground floor adjoining the weaving department, has a total area of 50 by 100 feet, and was built particularly for this purpose. The course of instruction was started in the fall, 1915, by a returned student graduate from Tokio University, Japan. The baths, either big or small, are all of Chinese porcelain. As there is neither natural nor arti-

ficial gas, wood is substituted. Some dyestuffs are imported from Europe, some from Japan and some are domestic products. More than one hundred and fifty varieties of them are in use. All the yarns, both for the hand and power weaving of the school and for the weaving mill, which is directly managed by the school, are dyed in this dye house. A bleachery is included in this house. Only cotton and silk skeins are dyed by the students, and are for practical purposes. This course is extended to two years.

The evening school was started in the fall, 1916, under the leadership of Mr. L. H. Chow, a graduate of the New Bedford Textile School, and who is now the director of the day school, with the desire for the extension of the textile knowledge among the working class. For admission to the evening classes there are practically no requirements,

A CORNER IN THE JACQUARD DEPARTMENT.

and instruction is provided in certain elementary subjects for those whose primary education has been defective. The classes are conducted in the school building from seven to nine o'clock every evening in the week except Saturday and Sunday evenings. The entire course of instruction consists of English, mathematics, elementary bookkeeping and textile machinery calculations. A majority of the evening school students are ambitious young men, 15 to 20 years of age, from the Dah Sung Mill. The training of this class of operatives is particularly desirable in China where skilled evening schools are few, especially the textile evening school. This deed is entirely credited to Mr. L. H. Chow, who possesses a deeply sympathetic feeling towards the working class.

The day school offers a one year preparatory and three years regular textile course, but no special courses. Each class has 42 hours per week, from 8 to 12 o'clock A. M., then from 1 to 4 P. M. daily except Sunday. Each school year consists of thirty-six weeks, making eighteen weeks in each semester. The first semester begins in the first of September and continues to the middle of December, with three weeks for new year vacation; and the second semester begins in the middle of January and runs to the early part of July. The following is the schedule of instruction for the present year:

THE PREPARATORY YEAR.

	Hours per week
English	16
Chinese	8
Mathematics	8
Chemistry	3
Free Hand Drawing	2
Mechanical Drawing	3
Textile Fibres	2

FIRST YEAR.

	Hours per week
English	8
Chinese	6
Mathematics	4
Chemistry	4
Hand Weaving	7
Fabric Analysis	3
Weave Formation	3
Mechanical Drawing	5
Cotton Spinning	2

SECOND YEAR.

	Hours per week
Cotton Spinning	4
Jacquard Designing and Weaving	4
Fabric Analysis	3
Weave Formation	3
Chemistry	8
Dyeing and Textile Chemistry	8
Hand and Power Weaving	10
Mechanical Drawing	3
Machine Shop Practice	3

THIRD YEAR.

	Hours per week
Cotton Spinning	6
Silk	5
Jacquard	7
Electricity	4
Chemistry and Dyeing	6
Cotton Mill Management	2
Cotton Mill Accounting	2
Power Weaving	3
Fabric Analysis	3

The school library contains more than 200 volumes on the various subjects of textile and kindred branches of industry and the most important volumes are as follows:

Weaving Mill Management, by Foster.
Cotton Spinning Calculations, by Taggart.
Cotton Mill Machinery Calculations, by Parker.
Entire set of I. C. C. S. books, 8 volumes on Textiles.
A Method of Determining Costs in a Cotton Mill, by H. W. Nichols.
Textile Mechanics, by Taggart.
Jacquard Weaving and Designing, by T. B. Bell.

The Microscope, by Hogg.

Ventilation and Humidity in Textile Mills and Factories, by C. H. Lander.

The American Cotton Industry, by T. M. Young.

Colour, by Geo. H. Hurst.

The Textile Industries, 8 volumes, by William S. Murphy.

Cotton Yarn Manufacture, by Winchester.

Cotton Card Room Machinery, The Whitin Machine Works.

The Cotton Manufacturing Industry of U. S., by Copeland.

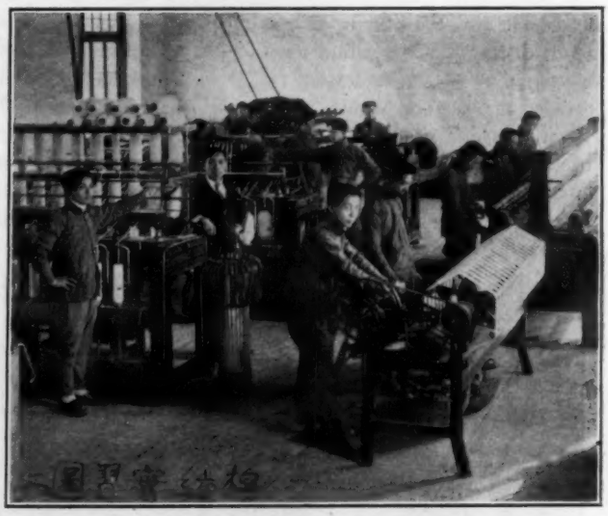
The school management wishes to buy more textile books, but they are not well informed as to the newest books published. Any information or catalogues on the subject of textiles that any publishers wish to mail to the school from time to time will be greatly appreciated. Besides these valuable books, the school has subscribed to many American textile magazines. COTTON is considered the best one of all, for its articles are helpful, clear and practical to our students. For these reasons the following question is often heard in the library: "Where is COTTON?"

The annual appropriation for the school expense by the Dah Sung Mill is being 2,000 per month maximum, and if any monthly expense is over the limit a special permission must be secured from the founder of the school. Free lodging, free board and other stationary articles are given to officers and teachers of the institution. Printed lecture notes, designing papers and various articles for class room use are given to the students free of charge. The school catalogue has printed the following words in italic lines: "Each student is required to pay each year eighteen dollars

STUDENTS AT WORK.

for accidental fee, including tuition and lodging, two dollars for athletic fee and two dollars for laboratory fee, and no more, regardless of whether his face is black or white or yellow; whether he comes from Pekin, Canton, or Shanghai." The founder, Mr. Chang Chien, a broad minded man like Mr. T. C. Searen, the founder of the Philadelphia Textile School, devotes his time and untiring service for extension of the school, from its first inception to its present high state of development, and does not want to keep any ambitious young man from coming from outside by charging him double tuition. This is a Chinese way of doing things to treat every one on the equal footing. Since its birth, the school has been spending more than two hundred dollars each year for each student, not including the cost of land, buildings and the machinery equipment.

The school regulations may be very strange and yet may be very interesting to Americans. Every morning, including Sunday morning, a bell rings promptly at six-thirty calling the students up. The second bell, which rings six times, means that breakfast is ready. An hour period means only 45 minutes, for there are 15 minutes for intermission in each hour. After four P. M. a certain set of student body is required to play western games on the college campus. The study hours are from seven to nine in the eve-



A VIEW IN THE MECHANICAL BUILDING.

nings and at nine o'clock a bell rings six times telling the students to quit studying. These rules are not enforced on Sundays. Any remarks, sarcastic talk, or the like, against any officers or teachers of the institution is strictly prohibited, and in some cases the wrong kind of merry-makers may be expelled from the school. Ben Franklin's motto has been maintained, but sometimes it is slightly modified: "Early to bed and early to rise, learn to be healthy, wealthy, or otherwise." All students arise to salute teachers both coming and leaving the class rooms. It can be readily seen that this institution provides not only technical training, but also cultural training as well.

The steady growth of the institution is due to nothing else so much as to the success of its graduates. The breadth of their technical training has enabled them to enter many textile fields of importance. Only two classes have graduated so far, one in 1916, consisting of 9 students, and the other in 1917, numbering 19. They have secured positions in mills with the assistance of the school, as clerks, overseers, teachers and the like. They have proved themselves capable and useful wherever they go. Many positions are already offered to those who will graduate next July.

The school organized a weaving shed last year consisting of 40 hand looms under the charge of a graduate. The cloth made is 27 inches wide from the loom and contains 75 ends and 50 picks per inch. The warp yarn used is of 2/40's and filling, 2/42's. Each weaver is paid from 50 to 60 cents per cut of 50 feet. Each cut of 50 feet is sold for four dollars in the local market. The working hours are from seven to six. If the demand for such goods is great,

the work is carried on at night. Whatever profit is derived from this weaving shed goes to defray the school expenditure.

The next tangible form of success is the establishment of the bed spread mill which is often called the "blanket mill" by the students. It was operated early in the summer of 1915 under the leadership of a graduate student, with an initial capital of $700. The officers and teachers of the institution are the main stockholders. The mill is located within 50 yards from the school and at first was equipped with ten hand jacquard looms mounted with combination tie. The average jacquard head imported from Japan costs 70 yens and the frames were constructed by the mill itself. The business was very prosperous in the first year and the net profit was over a hundred per cent. In 1916 the mill was again expanded, the capital had been increased to $5000, and the number of looms had been increased to 30. The business continued increasing until 1917, when the total capital reached to $10,000 and the number of looms increased to 50. The width and length of the bed spread is 5 feet 9 inches by 10 feet 5 inches. Each loom can produce from four to five pieces a day. Two weavers are required to run one loom and are paid 40 cents per

SOME OF THE PLAIN LOOMS.

working day of 11 hours. The fabric contains 34 ends and 18 picks per inch with 16's warp yarn and 2½'s filling yarn. The yarn in bleached or dyed in skeins before weaving. The price per piece being $2.50 or $25.00 per dozen. This mill is the only one of the kind in China and the demand is always greater than the supply. The market for selling this class of fabric is found principally in the local stores, Shanghai, and its vicinity. The chief factors which make this mill prosperous are effective and honest management, practical technical skill of the mill engineer, cheap labor and the way of getting yarns from the Dah Sung Mill at a reasonable price.

The growth of the school is rather surprising. In its beginning it was with limited equipment, instructing staff and means, later the curriculum was, however, rapidly extended; department after department had been equipped and opened; now all departments are open for instruction under an extensive and able corps of instructors. It has so advanced both in the standard and character of its work as well as the standard for admission, that the Board of Education in Pekin in the summer of 1917, after a thorough inspection and investigation, has recognized it as being a regular textile college. The intention of the founder is to make the institution one of the foremost, best equipped and high standing textile schools in the world. It is self evident that this school has been, and will be in the near future, of vital importance, not only in training intelligent and ambitious young men to fill responsible positions in textile mills, and in helping them to become capable of managing a department in a modern mill, or of superintending a whole mill; but also in aiding them to bring about technical improvement and to revolutionize the domestic cotton industry to a new epoch. The school management is contemplating the addition of a course in knitting in the near future and has written to some American knitting machine manufacturers for information and favor in regard to a small purchase. The courses in the manufacture of flax, hemp, woolen and worsted will be added to the school program in due time.

This school may exert more influence upon the cotton industry in China than the American textile schools exert upon the American cotton industry, as it is the only one in the country. American builders of the various textile machines should keep closely in touch with the institution, sending catalogs or other necessary information in order to create a closer commercial relation between the two peoples engaging in the same industry. It would be a valuable means to advertise one's firm in the school, for it is the best advertising center in China for American textile machinery. It is with regret that we say that the school is equipped with English made machinery, but the school management desires to add some American made machines in the near future. Since the European war began China is looking for America to supply all her textile machinery. It has been shown during the last two years that many new Chinese cotton mills have been equipped with American machinery made by the Saco-Lowell Shops. Mr. Chang Chien is contemplating the introduction of American machinery into his future mills and he is expecting to establish three within the next three years. It is now up to American textile machinery manufacturers to grasp this golden opportunity and hold it firmly.

Eighth Annual Reunion.

The eighth annual mid-winter reunion of the Olney Chemical Alumni of the Lowell Textile School Evening course was held at the Richardson Hotel, Lawrence, Mass., Saturday afternoon and evening February 16, 1918. The following members were elected officers: Samuel J. Nichol, Pres.; James H. Spurr, Vice-Pres.; A. T. Herron, Sec. and Treas.; Harry Buckley, Samuel Stott, James Meyers, and Geo. Stewart, Board of Control.

After the business meeting adjourned a banquet was served during which the Arion Male Quartett of Lawrence rendered appropriate selections. After the banquet there were some very interesting speeches given by Prin. C. H. Eames, Prof. L. A. Olney, Dr. H. D. Smith and Mr. R. R. Sleeper of the Lowell Textile School and Agent Wm. A. Pedler of the Acadia Mills, Lawrence, Mass. About forty members attended the reunion and all pronounced it the best they had ever attended. The annual summer outing was voted to be held some Saturday in June.

Neutralize Static Electricity

One of the most interesting applications of electricity in the modern cotton mill is the suppression of static, or frictional electricity, particularly during carding and drawing. This is accomplished by the use of electricity in the form of a high tension alternating charge, the principle discovered by William H. Chapman and used in the Chapman electric neutralizer.

Static electricity, generated by friction, was for a long time a serious problem in the handling of dielectric substances, such as cotton, wool, silk, paper, rubber, celluloid, etc. Friction upsets the electrical equilibrium of such substances, and leaves them charged, sometimes with a positive and sometimes with a negative charge. When these substances have like charges they repel each other, and they attract each other when the charges are different. When any of these substances are charged either way, however, they are attracted by other bodies not in a charged state.

This goes back to first principles, the oldest known to electrical science; but they contain the explanation of why climate, seasons of the year or weather variations, make a difference in working such materials during manufacture.

ATMOSPHERE AND STATIC ELECTRICITY.

Static electricity is generated most readily in cotton and other substances and retained in them in a dry atmosphere at a low temperature. It is generated in them least readily in a saturated atmosphere at a high temperature. It is generally intended to keep these conditions as nearly uniform as possible, somewhere between the two undesirable extremes—preferably at a point favorable to the health and efficiency of the operatives.

Many mills are equipped with highly developed air-conditioning systems. These take care of ventilation and are capable of regulating temperature and relative humidity both upward and downward. Thus they maintain a comfortable and invigorating temperature with a sufficient amount of moisture to keep down irritating germ-laden dust. Conditions that are based on these considerations of health and comfort are also satisfactory as to weights, etc.

It is an abuse of such systems to attempt to control static electricity by excessive humidity and high temperature. The Chapman electric neutralizer is used extensively in textile and several other industries in this and foreign countries as the only effective method of overcoming troubles arising from the generation of static electricity in the stock.

The Chapman neutralizer will not prevent the formation of static electricity, nor will any thing else. Its function is to kill the charge instantaneously by the natural selection of an opposing charge.

A small amount of electrical energy is taken from the light or power main by means of one or several special transformers (Fig. 1.) by which it is converted into an alternating charge at about ten thousand volts. Its volume, however, is limited to a few thousandths of an ampere and, therefore, is perfectly harmless. This limitation is an inherent feature of the design of the transformers, the entire output of which can be taken by a child with absolute safety.

When applied to a section of cards, a heavily insulated special steel wire, on special porcelain insulators, brings the alternating charge of ten thousand volts into each card. Whenever possible this is done on the ceiling of the card room. When wired below, which is preferable, a cable is connected with the high-tension line and brought up through the floor enclosed in a wooden tube, nearly two inches in diameter and about thirty-two inches long. This tube stands at the doffer end of the card, supported by a floor flange, and projects through the floor about one inch.

FIG. 1. THE SPECIAL TRANSFORMER.

Suitable brackets attached to the doffer comb boxes support the hinged inductor holders. These hold the "Inductor" directly over the comb, just above its upward limit of travel. The inductor is adjusted in such a manner that it can be thrown back on its hinged supports, or readily detached.

HOW THE CHAPMAN PROCESS WORKS.

A number of types of inductors are used, depending on the work required. The inductor used on a card, is a tube as long as the comb and contains a series of sharp points

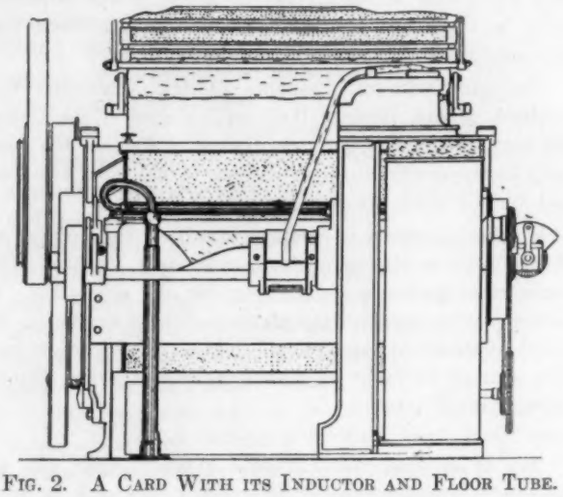


FIG. 2. A CARD WITH ITS INDUCTOR AND FLOOR TUBE.

spaced about one and seven-eights inches apart. Each of these points is housed in an insulating casing and is flush with this casing at the end.

The inductor is connected with the cable in the floor tube by a cable and socket. The points of the inductor, however, are not in actual contact with the high-tension line. Yet, they are fully as effective as if they were. As the charge is transmitted to the inductors by the induction principles, a slight tickling is the only sensation derived by touching the inductors with the hand.

The action of the inductors is as follows: There is a continuous brush discharge from each point, and it alter-

nates in polarity in accordance with the frequency of the primary circuit. This ionization radiates from the points for several inches, so that the cotton is within the field of operation as soon as it is stripped from the doffer by the comb. Any charge, positive or negative, developed in the cotton as it comes through the card has an affinity for an equal quantity of electricity of the opposite sign. By natural selection in the alternating field, which is provided by the inductor, the opposite charge is instantly and exactly satisfied and the cotton passes on absolutely neutral and inert. Figure 2 shows a Saco-Lowell card with its inductor and floor tube. A card so treated, it is claimed, is capable of carding cotton, gray, bleached or dyed, out of doors at the North Pole or on the sands of the Sahara Desert.

The Chapman electric neutralizer is remarkable in many respects. The operating cost is negligible. In one large New England mill it has amounted to 12 cents per card per year for several years, on a section of seventy cards. More than two hundred cards in this same mill are treated by the Chapman system. The moistening system formerly used in these card rooms has long since been discontinued.

A feature especially worthy of note is that this system is instantly put into full commission by the same operation as switching on a light.

The brush discharge at the inductors gives rise to the formation of ozone in a mild and beneficial degree, and is a valuable feature owing to its deodorizing and purifying effect on the atmosphere.

Much waste is prevented in carding by the ease with which the cards are started in the morning, under any weather conditions. Fly and breakage of webbs are saved owing to the fact that the webb comes off inert and free from all mutual repulsion in the fibres, which otherwise would be caused by static electricity. It is obvious that these conditions also result in a superior sliver.

The manufacturers, Chapman Electric Neutralizer Co., Portland, Maine, through their selling agents, the United Printing Machinery Company, Boston, state that the foregoing facts come from the experience of mill men who have used the Chapman system for several years.

While this article is confined mostly to the application of the Chapman electric neutralizer to cards, its application to drawing frames is equally popular and successful. In fact, any problem involving static electricity can be readily solved by means of this system. Fundamental patents have been granted in favor of the neutralizer in every country having patent laws.

The West Point Iron Works at West Point, Ga. has recently purchased the entire business of the Pike Bros. Lumber Company at LaGrange, Ga. and will reorganize this business under the name of the LaGrange Lumber & Supply Company with a capital stock of $75,000. This proposition will doubtless be under the general management of Horace Lanier, vice president of the West Point Iron Works, and will follow closely the lines of the West Point Iron Works by looking after the needs and interests of the cotton mills and carrying at all times a large stock of mill supplies of every description. While this proposition will come under the same general management as the West Point plant, it will be operated as an entirely separate business.

How to Report Net Income Under the War Revenue Act.

BY RALPH H. BUTZ.

Many thousands of business men, whose incomes or profits were not taxable under the previous income tax laws, will this year be required to file reports of their incomes or profits, which will be subject to tax according to the provisions of the War Revenue Act of 1917. These reports must be filed on or before March 1, 1918. (Time has been extended to April 1st.)

It is the purpose to give in this article a number of concrete examples of the manner in which the business man's income or profits will be affected, and also to interpret the law in such a manner that he will be enabled to make a correct return of the net income for the year.

The liability for taxes on incomes and excess profits is covered by Titles I and II of the War Revenue Act, and the provisions contained under these titles are applicable to corporations, partnerships and individuals.

In this connection the tax liability of corporations will be treated first. There are three separate taxes imposed on corporations, which are as follows:

1. Tax on Net Income
2. Tax on Excess Profits
3. Tax on Undistributed Earnings

TAX ON NET INCOME.

Under the law of 1916 a tax of 2% was imposed on the net income of corporations, and this provision still remains in force. However, the law of 1917 imposes an additional tax of 4% on the net income, as provided in Section 4. Thus the income tax for 1917 must be computed at 6%. In 1916 a corporation's net income of $50,000 was subject to a tax of $1,000, while in 1917 the same amount of net income would be subject to a tax of $3,000.

TAX ON EXCESS PROFITS.

The tax on excess profits is the one from which the government will derive the greater portion of revenue. Many industries have been greatly benefited financially as a result of the conditions brought about by the war. The excess profits tax is to be levied on the principle that the industries which have been benefited through war conditions should therefore contribute a proportion of their increased profits to the government. However, the law as finally passed does not exempt a corporation or other form of business organization from paying the excess profits tax, whether they have or have not received any benefit from war conditions. If a corporation had an annual net income of $100,000 during the pre-war period, and its annual net income for 1917 does not exceed this amount, it will still be required to pay the tax on excess profits.

The excess profits tax covers all earnings since January 1, 1917; so that the first taxable year ended December 31, 1917, and for which period corporations must file their returns. However, if a corporation has fixed its own fiscal year, then the taxable year for such a corporation is the fiscal year ending during the calendar year of 1917. The amount of tax payable will then be computed on the earnings of the corporation from January 1, 1917, to the end of such fiscal year.

There are a number of methods by which the excess

profits tax may be ascertained, but the first method mentioned in Section 203 is the one which will be used by those corporations whose invested capital and annual net income are definitely known. This method is explained in the following paragraphs, and a complete Schedule is given for ready reference.

Assuming a corporation with a capital of $100,000 having an annual net income of $50,000 for the year 1917. With these figures stated we may compute the tax in the following manner:

SCHEDULE A.

1.	Net income		$50,000
2.	Deducting 9% of capital, the maximum deductions	$9,000	
3.	Plus additional deduction of	3,000	12,000
4.	Taxable net income		$38,000
5.	Tax on amount of net income in excess of deduction and not over 15% of capital, $3,000 at 20%		600
6.	Tax on amount of net income in excess of 15% of capital and not over 20%, $5,000 at 25%		1,250
7.	Tax on amount of net income in excess of 20% of capital and not over 25%, $5,000 at 35%		1,750
8.	Tax on amount of net income in excess of 25% of capital and not over 35%, $8,000 at 45%		3,600
9.	Tax on amount of net income in excess of 33% of capital, $17,000 at 60%		10,200
	Total excess profits tax		$17,400
	Net income	$50,000	
	Less excess profits tax	17,400	
	Net income subject to 6% income tax	$32,600	1,956
	Total taxes		$19,356

Items 2 and 3 in the above schedule show that a deduction of $12,000 was made from the net income, thereby reducing the taxable income for excess profits tax to $38,000. This deduction is allowed according to Section 203 of the War Revenue Act, which is as follows:

"That for the purpose of this title the deduction shall be as follows: (a) in the case of a domestic corporation the sum of (1) an amount equal to the same percentage of the invested capital for the taxable year which the average amount of the annual net income during the pre-war period was of the invested capital for the pre-war period (but not less than seven or more than nine per centum of the invested capital for the taxable year) and $3,000."

This means in effect that if a corporation earned nine per cent upon its invested capital during the years previous to the war, then it will be allowed to deduct nine per cent of the amount of invested capital from the net income for 1917 before computing the excess profits tax, plus an additional deduction of $3,000, which is allowed in all cases.

"Where the invested capital is large and the net income is small in proportion, the tax will also be less. Thus a corporation with a capital investment of $500,000, whose annual net income is only $50,000, would be allowed deductions as follows:

Net income			$50,000
Deducting 9% of capital, the maximum deduction	$45,000		
Plus additional deduction of	3,000	48,000	
Net income subject to 20% excess profits tax	$ 2,000		$ 400
Net income		$50,000	
Less amount of excess profits tax		400	
Net income subject to 6% income tax		$49,600	2,976
Total taxes			$3,376

Items 5, 6, 7, 8 and 9 in Schedule A are covered by Section 201 of the War Revenue Act which requires that the excess profits tax be computed on the following basis:

5. "Twenty per centum of the amount of net income in excess of the deduction and not in excess of fifteen per centum of the invested capital for the taxable year;

15% of the invested capital.....$15,000
Less deduction 12,000

Amount subject to 20% excess profits tax .....$3,000...Tax $600

6. "Twenty-five per centum of the amount of net income in excess of fifteen per centum and not in excess of twenty per centum of such capital;

20% of the invested capital $20,000
Less 15% of the invested capital. 15,000

Amount subject to 25% excess profits tax.....$ 5,000.Tax $1,250

7. "Thirty-five per centum of the amount of net income in excess of twenty per centum and not in excess of twenty-five per centum of such capital;

25% of the invested capital $25,000
20% of the invested capital 20,000

Amount subject to 35% excess profits tax .....$ 5,000.Tax $1,750

8. "Forty-five per centum of the amount of net income in excess of twenty-five per centum and not in excess of thirty-three per centum of such capital;

33% of the invested capital....$33,000
Less 25% of the invested capital. 25,000

Amount subject to 45% excess profits tax .....$ 8,000.Tax $3,600

9. "Sixty per centum of the amount of net income in excess of thirty-three per centum of such capital."

Total net income $50,000
Less 33% of the invested capital. 33,000

Amount subject to 60% excess profits tax $17,000.Tax $10,200

The total amount of excess profits tax as shown by Schedule A is $17,400. This amount may then be deducted from the net income before the income tax of 6% is computed, making a total income tax of $1956. Adding together the excess profits tax and the income tax, the total taxes amount to $19,356.

TAX ON UNDISTRIBUTED EARNINGS.

Section 1206 (b) contains the provision that "there shall be levied, assessed, collected, and paid annually an additional tax of ten per centum upon the amount of net income remaining undistributed six months after the end of each calendar or fiscal year, of the total net income of every corporation, joint-stock company or association, received during the year, but not including the amount of any income taxes paid by it within the year imposed by the authority of the United States."

This provision was no doubt inserted to discourage corporations from retaining in their hands large amounts of undivided profits which are not required in the direct operation of the business. This provision will tend to encourage the distribution of profits in the form of dividends to stockholders, at least during the period of the war.

But it is further provided that "the tax imposed by this subdivision shall not apply to that portion of such undistributed net income which is actually invested and employed in the business or is retained for employment in the reasonable requirements of the business or is invested in obligations of the United States issued after September 1, 1917."

It is easily apparent that if a corporation invests its undivided profits in United States Government bonds issued

after September 1, 1917, the amounts of undistributed profits so invested will be free of tax; while if the amounts are invested in other classes of securities, then the tax will apply.

There is also a provision that if a corporation retains undistributed profits for employment in the business, and does not so employ these earnings, then they shall be subject to a tax of fifteen per cent. This provision is in the form of a penalty for attempted evasion of the payment of the 10% tax.

All corporations will have ample time for the proper distribution of their earnings, as the law allows six months time from the close of the year for this purpose.

COMPUTING TAXES FOR PARTNERSHIPS AND INDIVIDUALS.

Under the previous income tax laws, partnerships as such were not liable for income taxes, but the partners were required to pay tax on their individual incomes, which of course included the share of profits derived from the partnership. The War Revenue Act does not change this provision, and partnerships as such are not liable for income tax upon their net income. The partners must pay income tax if their shares of the profits are in excess of the deduction allowed by law for individuals.

Partnerships are liable for the excess profits tax. A partnership can make its returns for the fiscal year or calendar year, having the same privilege accorded to corporations. Every partnership having a net income in excess of $6,000 annually must file a correct return of its business for the taxable year; and all partnerships must, when so requested, render a correct return of the partnership business, whether the net income is or is not in excess of $6,000 per annum.

The excess profits tax applys to a parnerships in the same manner as explained for corporations, and is ascertained in the same manner as shown in Schedule A, with the one exception that corporations are entitled to add only $3,000 to the deduction, while partnerships are allowed to add $6,000.

INDIVIDUAL ENGAGED IN BUSINESS.

Assuming an individual to be engaged in business with an invested capital of $100,000, and an annual net income of $50,000, the excess profits tax would be computed in the same manner as shown by Schedule A. In this instance the tax on excess profits would be $16,800. The income tax for the individual will then be ascertained as shown below.

Net income of individual	50,000
Deduct excess profits tax	16,800
Net income subject to income tax	$33,200

Income Tax on $33,200.

$29,200 at 2 per cent	$ 584.00
31,200 " 2 " "	624.00
2,500 " 1 " "	25.00
2,500 " 2 " "	50.00
2,500 " 3 " "	75.00
2,500 " 4 " "	100.00
5,000 " 5 " "	250.00
13,200 " 3 " "	1,056.00
Total income tax	$ 2,764.00
Excess profits tax	16,800.00
Total taxes	$19,564.00

The law of 1916 imposes a tax of 2% on the income, with a deduction for the (married) individual of $4,000 allowed, which leaves $29,200, the first item. The law of 1917 imposes an additional tax of 2%, with a deduction of $2,000 allowed, which leaves $31,200, the second item. The six remaining items are computed according to the super tax. The super tax is as follows:

Tax of	1%	on income	over	$	5,000	up to	$	7,500
" "	2%	" "	"		7,500	" "		10,000
" "	3%	" "	"		10,000	" "		12,500
" "	4%	" "	"		12,500	" "		15,000
" "	5%	" "	"		15,000	" "		20,000
" "	8%	" "	"		20,000	" "		40,000

(For larger incomes refer to War Revenue Act.)

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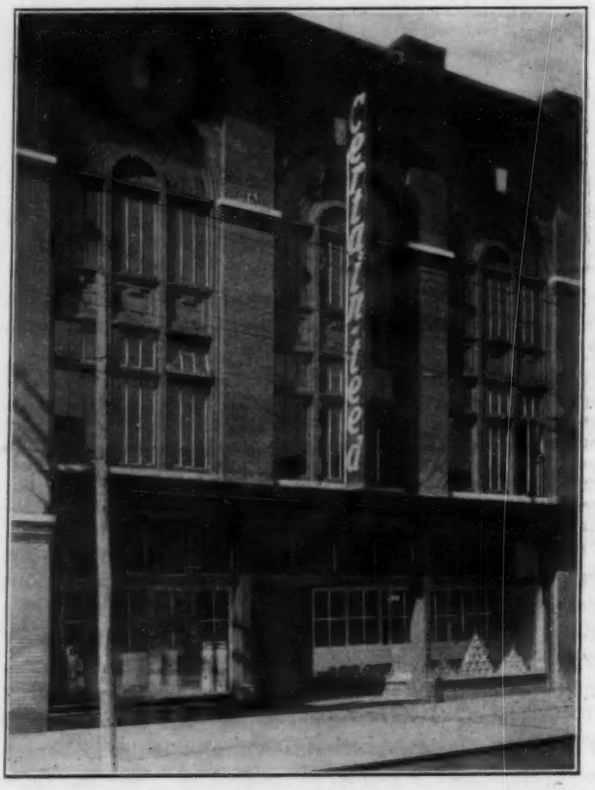
[Since this article was prepared a number of new rulings have been made, and a copy of such rulings should be secured from the Internal Revenue Department before making returns.—Editor.]

"Cleans Up" in Southern Territory.

The Atlanta Division of the Certain-teed Products Corporation has increased its business getting capacity to the point where it was found necessary to have its own office building and warehouse and they have recently completed moving to 440 Marietta Street, Atlanta, where they have a three story mill constructed building giving them about



NEW HOME OF THE ATLANTA DIVISION OF THE CERTAIN-TEED PRODUCTS CORPORATION, 440 MARIETTA ST., ATLANTA, GA.

five times as much office space as was formerly available and allowing them to carry a stock of approximately eight carloads of material on hand at one time.

Owing to the growth of their business they found it almost impossible to keep stock enough on hand to fill their orders in 1917. This was when the Certain-teed Products Corporation, whose headquarters are at St. Louis, Mo., manufactured practically nothing but fire resisting roofing. Recently, however, this corporation absorbed the Mound City Paint & Color Company and the Gregg Varnish Company and the necessity of marketing these commodities

AN INTERIOR VIEW OF THE MAIN OFFICE.

under the Certain-teed policy made it necessary for the Atlanta Division to increase their quarters very materially. Furthermore, the addition of these commodities will make this company as prominent a factor in the paint and varnish line as they have hitherto been in the roofing and building paper line.

The Certain-teed policy of marketing paint is to be along their usual lines, which is on a basis of costs plus a reasonable profit when figured on the volume of business they do. This policy is now an established principle, the chief features of which are: (1) selling quality goods at a reasonable profit, (2) taking a reasonable profit on each item sold, and (3) creating a wider market and increasing the total volume of merchandise by consistent advertising in the better known and representative magazines and papers.

STORAGE SHELVES NEAR THE ENTRANCE.

The accompanying illustration shows a view of the new quarters of the Atlanta Division of this Corporation. This Division is under the management of H. J. Oullette.

Mill Village Planning.*

BY E. S. DRAPER.

Before taking up the question of Mill Village Planning, let us consider the history of the Southern mill village, remarkable in its growth and metamorphosis. In the early days of the mill village, when the bare houses were erected, the village was considered finished. Little attention was paid to adequate sewage disposal or the question of satisfactory lights or water. The village has progressed through various stages, first one mill then another taking up the progressive features of the day. A glance at any representative Southern mill village of the present day shows a well equipped and happily organized community, houses electrically lighted and in many cases screened, running water, adequate sewage disposal—community houses, schools, Y. M. C. A.'s, model stores and churches—recreation facilities cared for by the playfields, parks, bath houses and swimming pools, and properly supervised by experts—home and community gardens fostered by agricultural instructors. The material needs of the village are in most cases well cared for. One who has seen the growth and change of the mill village to date with its improved appearance and manifold activities may wonder what the next logical step in progress will be—for progress it must—the laws of evolution require it either to progress or fall behind. It is inconceivable to think of a mill village lowering its standards, hence if it progresses what must that progression be?

Many people in the past, and some in the present I regret to say, have considered the landscape architest merely with reference to the planting of trees and shrubs, not realizing that the trained landscape architect must have a broad knowledge of architecture, engineering, general con-

*Extracts from a paper read before the Southern Textile Association.

struction work and many allied sciences, in addition to knowing how to plant trees and shrubs. Typical landscape gardeners, knowing little of professional work, must needs stress the planting end and hence have helped to create this illusion. Possibly a more comprehensive name for the landscape architect in the work would be "Community Planner." As such he is best qualified to study the development of the mill village.

Analyzing the subject of Mill Village Work, I classify it broadly under the two heads:

1. Planning of New Mill Villages.
2. Improvement of Old Mill Villages.

In many cases a mill village development will fall under both heads: i. e., involving the improvement of existing conditions and the extension of new facilities. The same main facts determine the landscape work in both. Where the land is virgin, the mill village may be located unhampered by aught save natural conditions. Where a portion of the development is under way, the existing portion may be studied to see wherein it may be improved, following out clearly established principles which I will attempt to define, and bearing in mind at all times the effect of the work already done.

Taking up the development of the mill village it is important that the location of every feature—including the mill itself wherever possible—be studied out in advance. The first step is a thorough study of the grounds—its hills, woods, topography, natural features, connections with the city and outside factors—so that the main locations can be established in mind. Then a topographical map should be made with contours at about five feet difference in elevation, showing existing roads, brooks, woods, houses, etc. Aside from the landscape use of such a map, it is a necessity from the standpoint of handling the sewer and water systems in the village. As a matter of fact worthy of comment here, the hilly, wooded tract with careful study often makes a much more attractive mill village than one on open, flat territory, though of course not as desirable for the old style parallel, gridiron layout of streets.

Most important is the location of streets and houses. The planning of the streets should always take into consideration the topography or grade of the land, if for no other reason than economy of construction—aside from the proper design of the village. From the standpoint of the streets, ease of access to the mill and community center buildings is an important feature. Different factors arise in each problem and the question of correlating them all to form harmonious components of a well balanced design is often a knotty problem for the landscape architect to solve. Bear in mind that every street must have a reason for existence:—if it is a traffic street it must go a certain direction and connect with certain points, giving convenient access; if merely a minor street, it need only be considered in the light of the houses it serves.

The typical lot size for the village lots should be decided early. Although varying according to natural conditions it is fairly uniform.

The location of houses is the biggest single factor affecting the general appearance of the village. Locations to avoid monotony of appearance must be chosen if the village is to be lifted from the commonplace. Straight rows of porch fronts are always tiresome, and occasional setbacks at different distances from the sidewalk—if studied as part of a well ordered scheme—will serve to improve the appearance of a straight street. In as much as locations of houses on curved streets automatically vary with the street, it is easy to see that the question of monotony is easier solved with the curved street. Yet there are often places where a straight street serves the needs more satisfactorily than a curved street. Considering such streets from the standpoint of house appearance—in addition to the possibilities of varying setbacks of the houses—it is well to arrange for an adequate terminus to the street—often one building in the Community Group—church, store or school or even the mill itself will serve this purpose. Wherever possible the houses should be so arranged in each block that house locations at the end of the block serve to render the interior more private and screen the views through the rear yards. In speaking of the Community Center or Group, we refer to the grouping of the buildings of a semi-public nature, such as the church, store, school, Y. M. C. A., etc., usually advisable both from a practical as well as an artistic standpoint.

The location of adequate parks and playgrounds is now considered important by all mill men. I need not take the trouble to explain the value of playfields to the growing child, nor the entertainment which the employees as a whole derive from recreative features. A location close to the school and community houses with the mill near at hand. Here again, topography is a big factor. Hilly ground cannot be utilized for sports though it may serve admirably for a general park or a small children's playground, particularly if wooded.

The engineering details of staking out the streets and houses are first on the program. After this is done, the question of grading the streets and lots comes in.

Street sections are worthy of careful study. Oftentimes on side hills, the sidewalks can be kept above the street and the difference in grade taken up by the parking strips. Parking strips also serve an important function in enabling "over all" distances across streets between houses to be greater to fulfill insurance requirements, without widening the width of the roadbed more than is necessary. (On sunny tracts of land, the park strips serve a splendid function as space for street tree planting.) By roadbed, we mean that portion of the street used by teams or autos. I do not believe an overly wide roadbed is desirable on most village streets. I should prefer to see a twenty foot road kept up and free from grass and weeds than a much wider road with grass and weeds growing in the roadway. Traffic conditions in the main village street may require wider vehicular space. There seems to be a tendency to emphasize sidewalks, often making them of concrete while the roadway is of dirt. Analyze the reasons for this and you will readily see that the greater amount of foot traffic in a mill village renders this treatment justified, although the roadbeds should always be maintained in a passable condition.

The gutters are important in caring for surface drainage—width from one to three feet depending on their importance as drainage water carriers. Where necessary to carry considerable water, it is usually better to pave them with brick, stone or concrete to avoid washing and undermining of the street. If the street location be permanent, the lessened cost of maintenance will pay for the permanent gutters in a short period of years.

(Continued on page 362.)

Mill Conditions and Market Reviews.

What the Southern Mills Are Doing.

One of the principal topics discussed by Southern cotton manufacturers during the past month has been the question of freight allowance and f. o. b. shipments. At the regular mid-winter meeting of the Cotton Manufacturers' Association of North Carolina the chief question for discussion was that of shipping goods either f. o. b. mill or with the uniform freight allowance. A committee was appointed to draw up a resolution in the matter and the following resolution was unanimously passed by the Association:

"It is the sense of this meeting that each manufacturer of piece goods notify their commission houses that all orders taken after April 1st, 1918 are to be f.o.b. mill, with freight allowance to destination, not exceeding 50c per cwt.; that the secretary of this association write the secretaries of the associations in the other Southern states of our action, and invite their co-operation."

Also at a meeting of the Hard Yarn Spinners' Association held in Charlotte, N. C. some ten days earlier, it was voted to sell all yarns beginning March 1st, 1918 f.o.b. mills without any freight allowance.

It is of interest to note in this connection that the Cotton Manufacturers' Association of North Carolina at their meeting endorsed the action of the Hard Yarn Spinners' Association in regard to yarns and also recommended that after March 1st., 1918 all yarns be sold f.o.b. mill with no freight allowance.

It is believed by members of these Associations that the mills will have the hearty co-operation of the commission men and brokers in introducing this new ruling and that it will be put into practice without any friction between the buyer and the seller.

Another item of interest to Southern mill men was the formal opening of the new building of the Southern Textile Exposition, Inc., at Greenville, early in February. This event was marked with interesting features appropriate to the occasion and citizens of Greenville naturally anticipate that this commodious building with its modern appointments will tend to induce expositions to come their way and make Greenville the Exposition City of the Piedmont section. It is also worthy of note to mention that A. B. Carter, for many years the well known secretary of the Southern Textile Association has been elected by the directors of the Southern Textile Exposition, Inc. to the position of Secretary and Assistant Treasurer of the Association, and Manager of the new Textile Building. In this work he will be assisted by A. G. Jones, of Greenville, who will act as assistant manager and look after many of the details to which Mr. Carter could not afford the time owing to many other business engagements requiring his attention.

The Dwight Manufacturing Company, at Alabama City, Ala., improvements at whose plant was mentioned some months ago, is rapidly approaching the final completion of these additions and improvements. These include some new Babcock & Wilcox boilers and a Nordberg engine of 1500 horsepower in addition to their previous power plant. Forty-eight new spinning frames and the accompanying machinery are also being added, as well as a number of new looms. A modern four story warehouse is to be built in the very near future. Naturally these additions call for more operatives and in order to accommodate these operatives a number of new cottages have been completed.

The Gower-McBee Electric Company at Greenville, S. C. has changed its name to the Gower-Mason Electric Company. These changes were brought about because of the fact that both T. C. Gower and Luther McBee are in the Government service. New interests have come in and the business is now under the direct management of C. Q. Mason. The new officers of the company include Dupont Guerry, of Huntington & Guerry, as president and Mr. Huntington of the same firm as secretary.

The Myrtle Mills, Inc., of Gastonia, N. C. is a new yarn mill recently established by J. H. Separk and associates for the manufacture of fine hosiery yarns. Plans are being prepared by Robert & Company, mill architects and engineers, of Atlanta, Ga., and it is understood that orders have been placed for the machinery.

Contract has been awarded at $15,367.50 to Woodruff & Chambers for erecting the Texas Textile Co.'s mill building at Houston. This will be a one-story 200' x 60-foot structure of reinforced concrete and hollow tile. It will be equipped for a daily capacity of 2000 pounds of absorbent cotton. The company was incorporated with $250,000 capital, and recently invited proposals on building its mill.

The Winnsboro (S. C.) Mills, formerly producers of wide print cloths only, are starting operations in their new mill on the manufacture of specialty tire fabrics, and expect within two or three months the plant will be in full operation. In the meantime, the company is selling small quantities of yarn in the open market. At the present time no further additions are contemplated in the way of buildings and machinery. The mill completed will contain 35,000 spindles. The entire production has been sold by contract to the United States Rubber Co. Lockwood, Greene & Co. of Boston and Atlanta are the managers of the Winnsboro Mills.

Six new cards and 116 new duck looms will be added by the Pelham (Ga.) Cotton Mills. This machinery has been ordered, the looms from the Draper Company of Hopedale, Mass., and the cards from the Saco-Lowell Shops, Boston, Mass.

Plowman & Company, the well known Philadelphia yarn merchants recently opened branch offices at Charlotte, N. C. in charge of S. C. Pitts, of Philadelphia who has moved to Charlotte.

The Vivian Cotton Mills at Cherryville, N. C. are arranging to build a large addition to the existing plant as soon as weather permits. This addition will virtually double the capacity of the mill.

It is reported that a cotton mill with $200,000 capital stock is to be promoted and built on the Seaboard Air Line Railroad near Goodsonville, N. C. This is about 2½ miles from Lincolnton, N. C. and it is understood that D. P. Rhodes and associates are promoting this enterprise.

An addition, 40x100 feet, two stories high, has been

erected by the LaFayette (Ga.) Cotton Mills to house the 40 new automatic looms and 2,240 ring spindles which it ordered a few months ago, as noted. The company now has an equipment of 9,408 spindles and 200 looms, manufacturing jeans.

The Union Cotton Mills, LaFayette, Ga., have installed the following new equipment in their plant: 20 Saco-Lowell spinning frames, 1 new slubber, 1 intermediate, 2 speeders, complete outfit of new pickers and new drawings. Nineteen additional frames are ordered and 3 warpers.

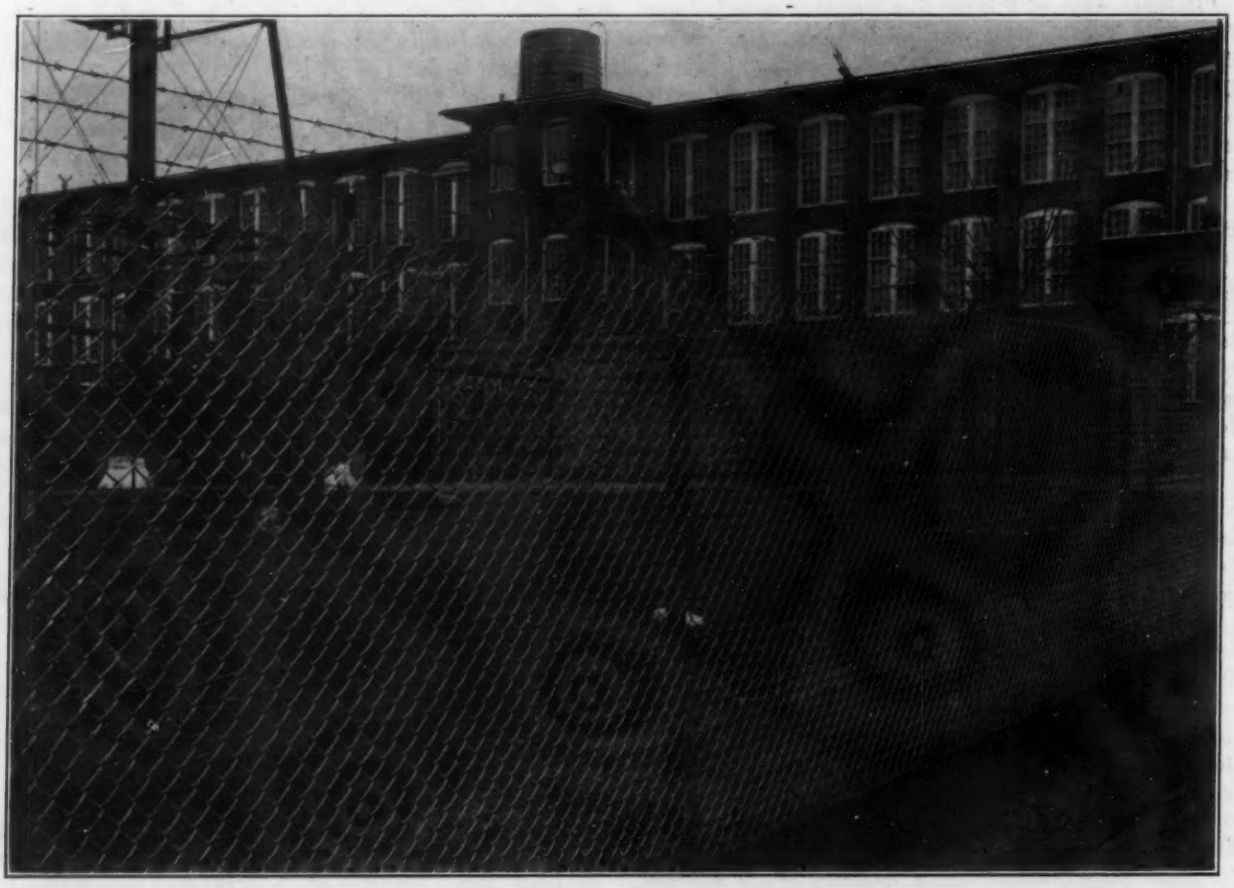
The Ninety-Six (S. C.) Cotton Mill has increased its capital from $200,000 to $400,000.

The 52 Whitin spinning frames ordered by the Trion Co., Trion, Ga., last fall have now arrived and are being set up. The company is also installing some new machinery in the card-room, as well as 2 spoolers and 2 twisters.

The Montala Manufacturing Company of Montgomery, Ala. have recently inclosed the mill property with a Cyclone property protection wire fence manufactured by the Cyclone Fence Company of Waukegan, Ill. This mill also expects to install a new cotton opening system for its picker room and six new roving frames for the card room.

The Avondale Cotton Mills at Birmingham, Ala. have just completed and put in operation a new addition 40 x 125 feet for a finishing room. This company has also just inclosed its plant with a Cyclone property protection wire fence made by the Cyclone Fence Company of Waukegan, Ill. This fence is set upon a concrete foundation about 3 feet high. Four new warehouses have been completed each 60 x 150 feet. These warehouses are equipped with reinforced concrete platforms.

The Mollohon Mfg. Co., Newberry, S. C., will install



THE CHAIN LINK WOVEN STEEL FACTORY FENCE AROUND THE SWIFT SPINNING MILLS, COLUMBUS, GA., FURNISHED BY THE ANCHOR POST IRON WORKS, OF NEW YORK.

The Swift Spinning Mills at Columbus, Ga. have just completed the installation of a new wire fence around the mill property. This fence, which was furnished by the Anchor Post Iron Works, of New York, through its Southern Office in the Empire Building, Atlanta, Ga., is 1250 feet in length, of the chain link type of 2-inch mesh made from No. 6 wire, and stands 7 feet high, being protected at the top with the usual overhanging barbed wires.

The Swift Manufacturing Company at Columbus, Ga. are inclosing that part of the mill property which was formerly protected by a wooden fence with the chain link type of wire fence of 2-inch mesh No. 6 wire. This fence is 8 feet high. The work is being done by the Anchor Post Iron Works of New York.

1,050 spindles and 368 automatic looms to replace old type looms and this new weaving machinery has been ordered. Upon completing this addition the Mollohon plant will have 40,050 spindles and 620 automatic looms. Wide print cloth and sheeting are the products.

Organization plans have been entirely completed for the Great Falls Agency, Inc., 350 Broadway, New York, with Claude Gore as president and treasurer and E. D. Tannahill secretary and manager. The company will engage as mill agents for the products of cotton spinning and weaving mills. It is planned to establish branch offices at Boston, Mass., Philadelphia, Pa., Providence, R. I., Chicago, Ill., Utica, N. Y., and Rockingham, N. C. Mr. Gore is president and treasurer of the Marlboro Cotton Mills, McColl,

S. C.; the Great Falls Manufacturing Company, Rockingham, N C., and also has other extensive interests throughout the South. Mr. Tannahill was connected with Paulson, Linkroum & Company, and its predecessors Buckingham & Paulson, for about twenty-four years. The entire output of the Marlboro Mills, both yarns and tire fabrics, will be sold through the latter's selling organization, E. D. Tannahill representing them on yarns, with headquarters at 350 Broadway, and Charles A. Meyer on cloths.

New England Mill Situation.

Cotton mills have been greatly hampered in the interval by lack of fuel and the operation of the restrictions imposed by the government. Transportation conditions have been poor. Orders for goods have been far in excess of mill capacity and the pressure of the government for merchandise is constant. Prices have continued upward and stocks in first hands are purely nominal. A great many mills have withdrawn from the markets until it is clearer to what extent production will continue restricted, and until something has been done in the way of positive progress in filling orders already in hand.

With one or two exceptions mills did not attempt to cancel the part of their orders that could not be filled for the time being on account of the government order for shutting down. Many mills are inaugurating new selling rules making "delivery at mill" supplant the old f. o. b. rule. The most important change is one announced by New Bedford mills that are putting out a new sale note in which the following contingencies are provided for: "The seller shall not be held responsible for delays, or failure of delivery due to fires, strikes, lockouts to counteract strikes, embargoes, delays by carriers or other conditions beyond the seller's control, and if the production of the seller shall be either partially or wholly curtailed thereby, for any period between this date and the end of deliveries as above provided, then the deliveries shall be either proportionally or wholly suspended, as the case may be, and resumed upon the removal of the difficulty, and continued at the aforesaid weekly rate thereafter, until the entire quantity purchased hereunder has been delivered. Goods held are at the purchasers' risk. They will be insured by the seller against fire and sprinkler damage only, and in case of loss, adjustment will be made pro rata with all goods damaged at the same time.

It will be seen that this new rule is a most drastic one. Buyers consider that it is wholly in favor of the seller and are submitting to it only as one of the unavoidable war measures, and one which they believe will be overcome and returned to the buyers' favor when normal competitive conditions are restored.

An important move was made by the War Department to secure needed supplies for hospitals, when Fall River mills were ordered on February 14 not to sell the product of any looms capable of making thin cloths until further notice. This order was preceded by a conference at New York between a dozen Fall River manufacturers and representatives of the government. An offer was made by the government to purchase 250,000,000 yards of bandage cloths, weighing from 12 to 14 yards to the pound, at 71 cents a pound. This price was 5 cents a pound higher than the last contract made with the government, but it was fully 20 cents a pound under the ruling market at the time. The mills made an offer to accept the business at 10 per cent under the market price. This offer was declined and the order to hold the looms for the government followed.

A great many mills, other than those notified to hold their looms in readiness, are engaged in manufacturing goods of this sort for civilian purposes. Some are in New Bedford and some are in the South. It is accepted now that the government has reached the point where it will virtually commandeer the product of these looms until its needs are filled, will put a price on the goods, and will ask that before civilian orders are accepted permission be secured from a Priority Board as in the case of cotton duck mills. Definite action is expected at any time, but in general, New England manufacturers expect to see a further and stronger control of both price and production for its needs, by the government. The war purchasing boards have been reorganized in the past few weeks and this move at Fall River was the first of importance to be taken.

The use of cloths of the character indicated is not confined to the government. Beef packers, cheese makers, tobacco plant growers and others have been buying the goods freely, and have been paying very high prices and passing the costs along to consumers of their finished articles.

Fine goods mills have been getting much more business and at much higher prices in the past few weeks. Quotations on plain combed lawns have advanced 2 cents on 12 cent a yard, and many of the poplins, venetians, voiles, and other cloths have shown a decidedly upward trend, in a number of instances as much as 5 cents per yard. Mills have been slow to accept the business as prices are still low compared with the very high cost of selected staple cotton for combing purposes. The position of many of the fine goods mills has been greatly improved as a consequence of some large orders distributed by the government on balloon, and aeroplane cloths. These fabrics are made from very fine yarns, closely woven, and while the orders are said to run only into about 15,000,000 yards, they can be filled so slowly, and take up so much of the spinning and weaving capacity, that mills are more independent of civilian business. Despite the uncertain and contracted orders fine mills were receiving, recent dividends show that the mills are prosperous.

Print cloths have reached new record prices, quotations at the middle of the month being on a basis of 14 cents for standard wide 64s, and 15¼ cents for 68 x 72s. Narrow print cloths sold in the New York markets on a basis of 10⅜ cents for 27 inch 64 x 60s in the middle of the month. The government is using wide 64 x 60s for raincoating purposes. Narrow cloths have been in very active demand as standard prints have become widely popular in the trade again. American prints have been priced at 13½ cents a yard and are withdrawn from the market. Most of the leading percales are sold up and withdrawn. A recent opening of printed shirtings priced on a basis of 16½ cents for 4-4 64 x 60s, was followed by the placing of larger orders than had been offered when the goods were 2 cents a yard lower. The job printers, engaged on fancy work have not been so busy as the large printers of staple corporation goods. Many of the latter are going out of the country, and the printers are also engaged heavily in dyeing cloths for raincoat and army slicker purposes.

Mills making flannellettes, domets, canton flannels, and

blankets have been overwhelmed with business and are cutting down their orders to insure deliveries. The Amoskeag Manufacturing Company received the largest fall orders ever given, and cut down 50 per cent on fancies, and 40 per cent on plain goods. A veritable famine of heavy canton flannels is reported and glove and mitten manufacturers using goods of this character are threatened with a shut down unless something can be done to increase the production. Prices for all of these goods are on a very high level yet buyers have not hesitated to place business for distant months.

There is no let up in the demand for goods of gingham construction. All mills are fully employed and could easily sell much more and for almost any delivery at top prices. Staple ginghams are particularly scarce although the last price was 18½ cents for the better grades. The demand for large plaids for children's dresses continues unabated. The demand for fancy colored novelties has increased. Mills do not care to take orders for fancy or novelty goods at any price, fearing difficulties with labor, or with government authorities who are discouraging non-essential production. Fancy zephyrs, fine voiles, and colored batistes are very scarce and bid fair to remain so. Orders placed on cotton dress goods of the heavier grades with wool finishes have been as large as mills can take. Serges, gabardines, plaids, and suiting effects have been ordered freely.

Bleached and brown cottons continue in active demand at high prices. Fruit of the Loom 4-4 goods have been advanced to 20 cents a yard, Lonsdales and Hills, to 19½ cents, and wide sheetings to a basis of 65 cents a yard for Pequot 10-4 goods. All mills are sold ahead for some months and all are behind on delivery owing to the cutting down of production by the fuel order and by increasing labor shortage. The medium count fine carded goods are in less demand than either print cloths or fine combed goods.

Miscellaneous small manufacturers making fancy goods are doing less business. They are endeavoring, as fast as possible, to enter upon the production of staple merchandise. The lace mills are very active on narrow edgings but are not finding much of a market for the very high priced goods although competition from abroad is negligible. The mills making fancy upholstery fabrics are doing little. The quilt mills keep busy but they have not been able to sell their product at anything like the ratio of advances seen in other lines. Mills that can make damask, plain towelings, or plain turkish goods are busier and have work ahead of them for some time.

Heavy colored goods of hard yarns are at a premium. The government has taken over so many looms on tickings, denims, drills, and similar merchandise, that civilian orders must wait their turn. This has forced prices up steadily. The larger mills cannot begin to take care of their regular customers. The government has been buying blue denims and now wants brown denims freely.

Knit goods manufacturers are busy on staple goods. The fine fancy product for men and women's wear sells less freely while the medium and low grades can be moved promptly. Silk and cotton hosiery has been in better demand and there is a steady call for good grades of ladies lisle goods. The fancy knit goods business is decidedly quieter.

Bleaching and finishing plants have been running irregularly with less civilian work ahead of them than a year ago. Several of the large finishers are busy on government work. Whole plants have been turned over for dyeing khaki drills and other fabrics. Fancy printing has been improving in the past month, gingham styles on many kinds of cloths being wanted badly. Many mercerized foulards are being made in all cotton and in silk and cotton. The demand for sateens has been heightened by this development as well as by the large call for venetians for lining purposes.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, February 16th., 1918.

Fulfilling our prediction of last month, the tendency of market has been to lower levels owing to unfavorable fuel, transportation and export conditions resulting in curtailment of consumption and increasing stocks in the South, making statistics less bullish than one month ago, which is reflected in a decline of about one cent, or $5 per bale.

It is probable that the decline would have been greater were it not for the unfavorable outlook for the next crop in Texas, due to insufficient rain in that state. In Texas, December was the dryest of sixteen consecutive months, and closed the driest year on record. As yet there has been insufficient rain in Texas, the total average precipitation for January measuring only 0.71 of an inch vs 1.06 last year and the normal of 1.32, making the total for six months ending January 31st only 4.30 against 7.29 last year and 11.61 inches as a normal. It is feared that the Texas rains may hold off until planting time when they may be excessive and do more harm than good. If a general, heavy rain could be had over the state in the near future, the outlook would be made more promising. At the moment the situation in Texas is unsatisfactory.

Owing to the recent shutdown days to conserve fuel, consumption of cotton in the United States during January was only 524,000 bales compared with 601,000 for the corresponding month last year, making total for the first six months of the season less than for the same time last season—3,318,000 vs 3,358,000, linters not included, returns being unavailable.

For the same reason, shutdown days this month, consumption returns for February, to be issued next month, will likely compare unfavorably with February of last year when 547,000 bales were consumed, but with the passing of this month, consumption and the demand is likely to increase again as result of the suspending of the shutdown days.

Because of the inability to ship cotton in quantity to American mills, due to the freight embargo except for government requirements, and the scarcity of ocean tonnage to permit of large exports, the South is carrying about 644,000 bales more than she was carrying at this time one year ago. The redeeming feature of the situation, however, and one which gives encouragement to Southern spot owners to hold for higher prices, is the small stock held by American mills and the very small available supply of American cotton in Europe.

At the close of January, American spinners stocks were 609,000 bales smaller than on the corresponding date last season—1,697,000 vs 2,306,000, which serves to offset the excess over last year now in the interior, while the visible

of American in Europe is nearly 1,000,000 bales less than it was at this time one year ago—only 686,000 against 1,620,000, of which Liverpool is credited with only 385,000 vs 865,000 last year. It is apparent, therefore, if means are found to move the cotton in a larger volume to domestic and foreign spinners, that spinners of the world will likely be obliged to buy more freely in the South in the future.

Both American and European spinners are in a position to pay higher prices for cotton owing to the manufactured product commanding a price relatively much higher than the raw material. As a matter of fact the mills are working on a larger margin of profit than ever and are unable to meet the civilian demand because of the heavy demand by the government for cotton goods of every description.

Crop prospects in the Mississippi Valley States and in the South Atlantic section are still backward, but more favorable than in Texas, and will likely make good progress from now on if climate conditions permit.

Indications are that the market will probably improve again. The lifting of the freight embargo or a revival in the export demand would be a signal to buy in anticipation of higher prices.

The Yarn Market.

The past month in the yarn market has been confined largely to a search for spot yarns. Poor transportation conditions were responsible for much of this demand. However, failure to receive earlier purchases were to a large extent discouraging forward buying and offerings on stock yarns were almost as hard to find as coal. It was reported that North bound embargoes were delaying the shipment of yarns from many Southern points, naturally increasing the difficulty.

Early in the month the demand for combed yarns was spotty and Western knitters were the largest buyers of that period. The demand for mercerized yarn was a trifle better, while the buying of carded yarns on cones was largely a matter of spot yarns or deliveries running up to May. Many spinners declined to sell for later deliveries and some dealers report that manufacturers of heavy weight underwear seemed to be the only ones who are anxious for deliveries running well up into the Fall.

The f.o.b. discussion is an outgrowth of the freight congestion and a bone of contention between the yarn dealers and many of the mills. It is reported that one spinner desired pay for his yarn as soon as it was ready for shipment at the mill and as soon as he presented a bill after this material was ready for shipment. In other instances, and as a comparatively common practice, dealers are paying ten days after the receipt of invoice, and even with this understanding many dealers in the primary market have thousands of dollars worth of yarn tied up somewhere between the mill and their place of business. Payment for these "in transit" yarns make a comparatively heavy drain on the finances of some dealers. Another question that is still unsettled is that of who pays the freight. The Yarn Dealers' Association recently sent a request to the Spinners' Association to appoint a committee of seven to meet a similar committee of the dealers in New York and discuss the matter. At the time this is written no definite settlement had been made.

As the month wore on there continued to be a demand for 24's, 26's and 28's carded cones for spot and prompt deliveries. Eastern spinners of combed yarns were reported to be in need of business and it is said that some Southern spinners were changing from combed yarns to carded yarns. Carded weaving yarns were easier in prices for spot and quick deliveries.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

4s to 8s	50½@51	10s	51½@52
12s	52½@53	14s	54½@55
16s	56 @56½	20s	57 @57½
24s	57½@58	26s	57½@58
30s	58½@59		

Southern Single Warps.

8s	51½@52	10s	53½@54
12s	54 @54½	14s	55½@56
16s	58 @57½	20s	57½@58
26s	58 @58½	30s	65 @66
40s	69 @70		

Carpet and Upholstery Yarns in Skeins.

8-4 slack	51 @52	9-4 slack	52 @53
8-3-4 hard twist	50 @51		

Southern Two-Ply Skeins.

8s	51½@52	10s	53 @53½
12s	54 @54½	14s	55 @55½
10s	57 @57½	24s	57½@58
16s	55½@56	20s	57 @57½
24s	57½@58	26s	58 @58½
30s	59 @59½	36s	66 @67
40s	72 @73	50s	95 @96
60s	$1.00 @$1.05		

Southern Two-Ply Warps.

8s	52 @52½	10s	53½@54
12s	56 @56½	14s	56½@57
16s	57½@58	20s	57½@58
24s	58 @58½	26s	58½@59
30s	59 @60	40s	73 @74
50s	95 @96		

Northern Two-Ply Carded Peeler Skeins.

20s	58 @59	24s	60 @61
50s	98 @$1.00		

Two-Ply Combed Peeler Skeins.

20s	69 @70	24s	73 @74
30s	79 @80	40s	89 @90
50s	98 @$1.00	60s	$1.08@$1.10
70s	$1.30@$1.35	80s	$1.40@$1.45
80s	$1.40@$1.45		

Southern Frame Spun Carded Yarn on Cones.

8s	54½@55	10s	55 @55½
12s	55½@56	14s	56½@57
16s	57 @57½	18s	57½@58
20s	58 @58½	22s	58 @59½
24s	59½@60	26s	61 @62
30s	63 @64	40s	77 @78
30s tying in	61½@62		

Northern Mule Spun Carded Yarn on Cones.

10s	55 @55½	12s	56 @56½
14s	57 @57¼	16s	57½@58
18s	58 @58½	20s	59 @59½
24s	60 @60½	26s	63 @64
30s	69 @70	40s	81 @82

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	64 @64½	12s	64½@65
14s	65 @65½	16s	66 @66½
18s	68 @68½	20s	69½@70
22s	71 @72	26s	75 @76
36s	87 @88	38s	79 @80
40s	90 @92		

Lancashire Notes.

BY AN ENGLISH CORRESPONDENT.

Things have been very quiet in the trade during the past few weeks, and I think I cannot do better in my notes this month than to review a booklet on "Scientific Research in Relation to Cotton and the Cotton Industry." The booklet is published by the Provisional Committee on Research and Education for the Cotton Industry (108, Deansgate, Manchester, post free 9d.)—a body which was set up under Government auspices—and it will, I imagine, interest all cotton men.

The authors begin by taking stock of the present position. It is true that the climate of Lancashire is especially favorable for the industry, but other countries are learning how to humidify mills and to control their temperature. It is true also that coal is plentiful; but it is being wasted and its cost is going up. Moreover trade is estab-

lished at the very doors of the ports, the world is shrinking and the Panama Canal will give to Japan cheaper American cotton. In the matter of marketing, the foreigner is a formidable rival, and although the Lancashire trade may pride itself on the goodwill it has established, it is told in this booklet that "there is no goodwill in business except better quality." Complacency will not do. Cheaper and better production is an essential of continued success, and the urgent question is how that is to be attained. Lower wages as a means to this end is swept aside as being "neither practicable, nor effectual, nor justifiable;" "hustling" labor will not do; profits cannot be further cut; and more capital "without life-giving ideas is a dead thing." The only sure road for the future is "carefully planned systematic, and continual application of science."

In the matter of invention the cotton trade is stagnated. During the past fifty years the Northrop loom has been the only important invention. The Lancashire trade on its mechanical side "is the mere son of its father." The trade has cold-shouldered science. The story of the dyes is too well-known to need repetition, but it is not in that direction only that chemistry has been neglected. The chemistry of starch remains practically unknown, there is little real knowledge of the composition of the cotton fibre itself, and the researches into cellulose by English chemists have been almost entirely neglected. In the realm of physics the same tale must be told. The smallest weight in use is still the grain, although it is equal to the weight of from 10,000 to 20,000 single cotton fibres. Finally, there has been no study of botany, though the basis of the whole industry is a vegetable product. Say the authors:—

> "So far from there being any real antagonism between the interests of growers and spinners, their interests are identical and center in the cotton plant. The grower thinks first of all of the value of his product. What the spinner is interested in is rather to have a cotton that will suit his special purpose. Different kinds of material and different ways of finishing require different forms of cotton fibre. * * * The cotton user does not really know, except in the most vague and general terms, what his requirements are. Only research can provide a language comprehensible to both, and only when the cotton user knows exactly what his requirements are and is able to specify them will the cotton-grower begin to grow to the requirements of the different specifications."

Four general directions which organized research in the cotton trade might take are marked out: (a) the improvement of existing methods, and the avoidance or utilization of waste products; (b) the modification as required of the raw material; (c) the discovery of new processes and the invention of new kinds of finished goods; (d) the discovery of new powers and their application. Now, it is laid down that of these four things only the first has received attention. Other industries have made new discoveries. There has been the Bessemer process for making steel and its improvement by Thomas and Gilchrist, the economy of fuel by the Bonecourt furnace, the utilization of microphotography in the analysis of metals and steels and the production of high speed steel. The engineering industry has witnessed the coming of the turbine engine and the internal combustion engine. The chemical industry can also point to discoveries; and so one might go on. These things are not the fruits of chance, but of the patient investigation of trained men. They are an example for the cotton industry.

> "It is impossible to suppose that the cotton trade has reached finality and knows all that is to be known about the fibre and its manipulation. It is certain that there are still great discoveries to be made as the result of organized research on cotton-growing, on mill processes, such as spinning and the manufacture of fabrics, and on finishing processes, such as bleaching, dyeing and calico printing. Cotton is an imitator; under the guidance of science it can be sold as wool, as silk and as hair—perhaps even as wood and steel."

All branches of the trade would benefit by scientific research. If the spinner and manufacturer know "the internal history of the fibre" as it passes through the various processes they would be able "to tell the grower in accurate scientific terms in what particulars he ought to strive for improvement." A complete knowledge of the starches, their behavior under certain conditions and their relation would be of great value to the manufacturer and even more so to the bleacher, dyer and finisher, who would also gain by a closer acquaintance with the various chemical substances used for imparting certain colors or characteristics to material.

What the committee proposes is the formation of an Association of Cotton Research by the whole trade. The trade should provide the funds and in return exercise control. Government assistance, however, may be obtained. The attitude of the new Government Department of Scientific and Industrial Research is that it would give financial help providing it approved of the general ideas of the research, the trade itself having control of their particular application. The committee's proposals divide up into four divisions: (1) The collection and codification of information already available; (2) the foundation at some place within the British Empire of an experimental station and laboratory for cotton-growing; (3) the establishment of laboratories for research into the processes of manufacture; (4) the setting up of a Research Institute, with its own buildings and staff of experts. And here is a note of warning:

> "The results of our research will be pooled for the benefit of all the members * * * Let no one, therefore, join the association in the idea that he will at once receive exclusive information that will give him a pull over his British rivals. If he does he will be disappointed, for the association aims at benefiting the industry as a whole rather than at putting immediate profits into the pockets of individuals. * * * Also, the association is not an agency for the collection and dissemination of 'tips,' wrinkles and trade secrets."

Nevertheless, the association could be used by firms wishing to carry out special investigations for their own benefit, as is done at the laboratories provided for the purpose at the Mellon Institute of the University of Pittsburgh. Results gained in laboratories privately retained in such a manner would, of course, be strictly private property. The nearest approach to a Research Institute such as the committee has in mind is the institute established at Washington, D. C. by the National Canners' Association, where a great variety of bacteriological, biological, and chemical investigation is continually going on; but the cotton institute would cover a much wider field.

Then what of the cost? Estimates vary. Some say £20,000 would be sufficient to get a good start, but others think an immediate annual income of £50,000 necessary for adequate results. In any case the committee have no difficulty in showing that the burden on individual firms

(Continued on page 173.)

COTTON MANUFACTURING.

Things to Know About Drawing Rolls.

BY GEORGE S. BROWN.

Leather rolls are an expensive item in the operation of the carding department. There are ways to keep this expense down, and perhaps a few words in this connection as well as on rolls in general, both metallic and leather, may be interesting if not beneficial.

In the first place it may seem economy to run leather rolls as long as possible, but after a certain time, when they arrive at a certain worn condition, then they should be removed immediately, even though they apparently continue to run all right, or they will produce inferior work. And one bad roll can produce sufficient defective work in a very short time to offset the cost of covering a large number of rolls. No matter at what stage of progress in the mill the material is injured by a roll, it is impossible to remedy the damage. If the trouble happens at the drawing frame, the following doublings and attenuating at later processes will lessen the defect per yard but will do this by stretching it out over many more yards than were originally defective. So it behooves the carder to look out for his rolls and treat them with care in order that he may get all the wear possible before the time to replace them arrives; then, when that time does arrive, to see that they *are* replaced.

The best way to cover rolls is by the cot method, thereby getting but one piecing and having this straight across the roll, parallel to its axis. Do not have rolls covered by winding on a narrow strip in a spiral. The long hard piecing obtained in following this method serves to destroy the cushion effect of the leather. Unless the roll coverer is very expert and likewise very particular, a roll covered in this manner is apt to be uneven, and the resultant work also will be uneven.

After great care and pains have been taken to cover leather rolls and they have been delivered in the carding department, under no condition should they be handled carelessly. It is almost impossible to drop a leather covered roll on the floor or strike one against a machine without injuring the delicate covering. One jamb or bruise is sufficient to ruin a roll, as a dented or cut roll should not be put into a machine.

The majority of mills run solid-boss rolls in their slubbers, intermediates and fine frames because this makes front, middle and back rolls interchangeable. Interchangeable does not mean—as many consider—that the rolls may be put in and later changed about and turned about in any way. This will be explained later.

There are two chief things to note about covering rolls with solid double bosses: One of them is, to have both bosses of exactly the same diameter when covered. The other is to have the two cots put on with the laps pointing the same way.

Rolls having one boss of greater diameter than the other on account of different thicknesses of leather and cloth, produce defective work. The effect of this error in covering is shown in Fig. 1, only in a greatly exaggerated manner. Boss, *A-C*, is of smaller diameter than *B-D*. When this roll is placed in the frame, the outside edge of cot at *A*, and the inside edge of cot at *B*, support the roll, while edge *C*, and edge *D*, do not touch the steel rolls at all—or not sufficiently to draw evenly. This defect is easily discovered because as the traverse guides the roving towards edges, *A* and *B*, the resulting roving is drawn fairly even; then as the traverse moves the roving towards edges, *C* and *D*, the draft becomes uneven and the roving begins to show lumps, which increase in size as the roving approaches these two edges. The remedy is to throw out the roll. The fault lies with the roll coverer and he should be advised.

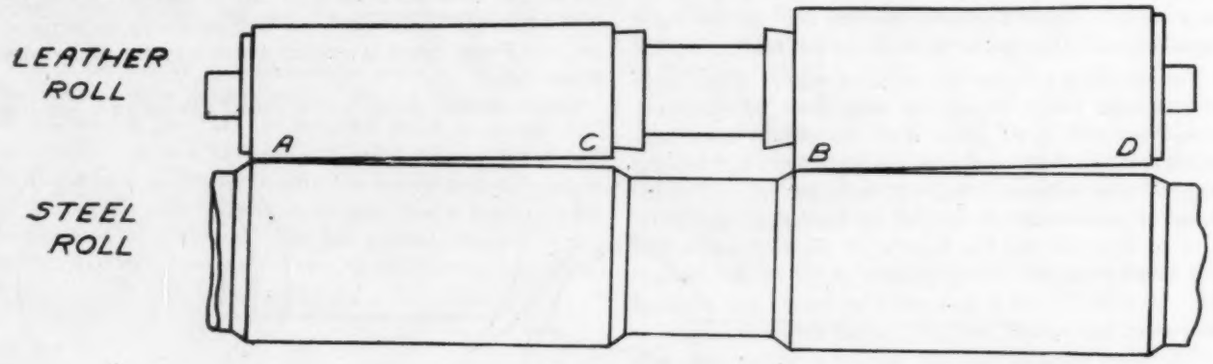


FIG. 1.

Loose boss rolls have a slight rocker movement on their arbors and will automatically adjust themselves to slight variations in the diameter of the bosses. This is shown in Fig. 2. The two shells are on the arbor but shell *X* is smaller in diameter than shell *Y*. The arbor has its bearing and applies pressure at *E* and *F* on the shells. Since the arbor is not a tight fit in the shells, and since it bears on but one point inside each shell, slightly raising one end of the arbor on account of one shell being a trifle larger than the other, will not cause defective work. The pressure will be practically even along the entire length of both shells because of the rocking motion permitted.

It is a better plan to caliper the shells and put two of the same diameter on an arbor. In this way no chances are taken of producing bad work. It is the correct way and should be followed out.

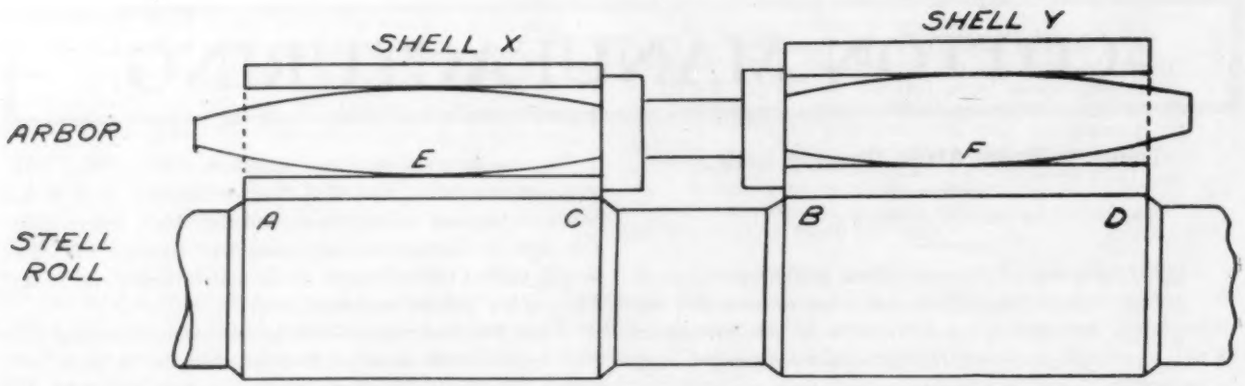


FIG. 2.

Ball bearing rolls are very sensitive to shells of different diameters on the same arbor. The principal cause for this is that ball bearing rolls do not require heavy weights to make them draw the roving correctly. While a very slight variation in the diameter of the bosses on a solid roll might be overcome by the cushion effect of the leather produced by the heavy weighting used, this would not occur with the light weighting on ball bearing rolls. Caliper every shell that goes on a ball bearing double boss roll—usually run on fine frames—and a new set of shells will start perfectly and give no trouble. Neglect to do this, and you are liable to get bad work through no fault of the ball bearing arbors.

The solid-boss roll with diameters of uneven length must be thrown out and recovered, but with shells, by calipering them, there will be no loss. Many complaints have been made about bad work on frames equipped with ball bearing rolls. If the shells are calipered when put on, and if the tenders are cautioned not to hook up the weights carelessly so as to drop the saddles heavily on the roll arbors and bend them, there will be no trouble at all in their operation. If cared for, they give excellent results and consume less power, less leather, and use less oil than other types.

The other point to look out for when having rolls covered besides getting bosses of equal diameter, is to be sure that the cots are put on both bosses with the laps pointing the same way. This applies to solid-boss rolls; to shells if they can be put on the arbors in but one way.

If one lap is pointed one way and the other in an opposite direction, when the roll is placed in the frame there is an early disintegration of one of the cots. Regardless as to how a carder believes the lap should run in a frame, the leather on one boss is sure to run the wrong way if the cots are drawn on with the laps pointing in opposite directions.

Much has been said and written as to which is the correct way to run a leather roll in reference to the way the lap should point. Fig. 3, *A*, shows the proper way a roll should be placed in a frame. The arrow on the bottom roll shows the way it turns. The bottom roll is the driver and drives the top roll by friction. Since the sliver or roving must be drawn out as the rolls revolve, more friction than the weight of the top roll itself is required. This friction is obtained by weighting the top roll. The more weight placed on the top roll, the greater will be the force exerted by the bottom roll to turn it.

In Fig. 3, the surface of the roll, *B*, as it revolves, pushes the surface of the roll, *A*, in the same direction that the steel roll, *B*, moves. With the lap running as shown at *A*, the motion of roll, *B*. has a tendency to smooth the edge of the lap and keep it tight. If the roll, *A*, is turned end for end and placed in the frame, the lap will be reversed and the steel roll, *B*, will be continually picking at the edge of the lap and sooner or later will open it up and ruin the roll.

It is often difficult to tell by looking at a roll which way the lap points, but by lightly brushing the finger across the lap, in most cases the edge can be detected. Roll, *A*, would have its sharp edge pointing as shown in sectional cut, *E*. From this it is evident which way the sharp edge should point.

Roll coverers should put a dot of ink on each cot just beyond the lap as shown at *D* on roll, *A*. Then the rolls can be put into the frame correctly with no delay or guess work. (Some roll coverers use a small rubber stamp and print an arrow pointed in the proper direction.)

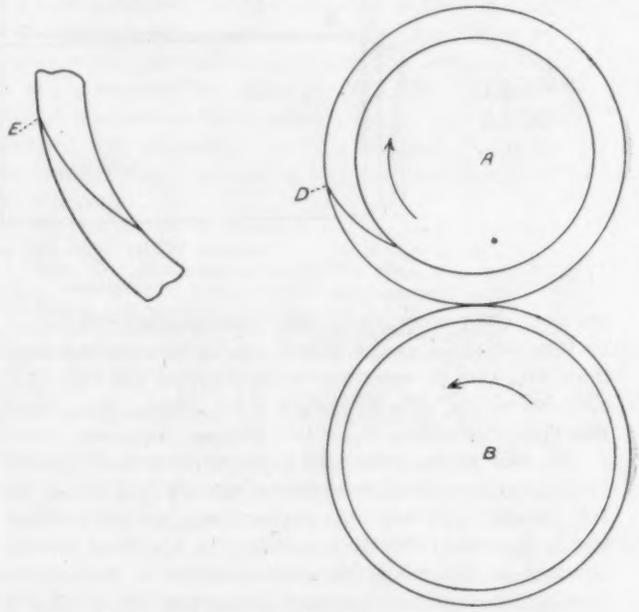


FIG. 3

The fact that the roving passes between the steel roll and the leather roll, has nothing to do about how the lap should face. Consult Fig. 4. The space taken up by the strand of roving is negligible when compared to the leather and steel of the bosses in contact. Top rolls put in the wrong way, often show it by licking when started up.

After rolls have been covered correctly and placed in the frames in a proper manner, they should not be neglected. They should be given care. Here are a few things to look out for:

Keep the traverse as wide as possible, A narrow traverse or none at all will speedily ruin a set of rolls. Now and then a traverse bar gets stuck or a connecting rod gets loose or slips so as to shorten the traverse or stop the motion entirely, then the rolls soon have a groove worn in the leather and lose their grip on the fibres. The result is bad work and damaged rolls. Keep the traverse as wide as possible and not run the roving off the ends of the roll

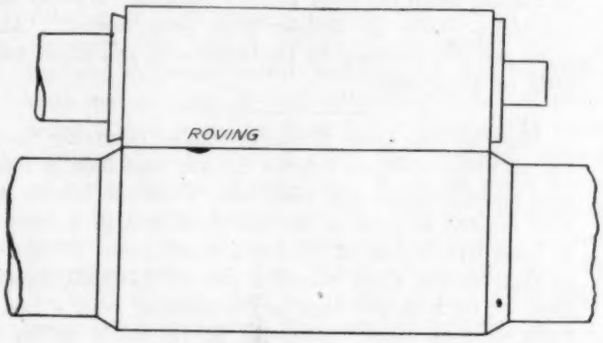


FIG 4

bosses. This method will give the longest wear and the best results.

It is the custom in most mills to move the rolls towards the back as they become worn. This custom is all right if not carried too far. A damaged front or middle roll is not fit to use as a back roll. A badly grooved roll if put in at the back is unable to grip the roving and it is taken by the second rolls without draft and thus a heavy roving is delivered at the front. In the general run and wear, moving the rolls towards the rear is the correct procedure.

Under no circumstances when the leather rolls are removed from a frame, should they be mixed up or turned end for end. Rolls should always run in the same direction that they were first put in the frame. If they are reversed, the leather is very liable to immediately wrinkle up and then the roll must be recovered. The continual friction of the bottom roll stretches the leather in one direction, but it does it so gradually that the cot does not wrinkle. Reversing the roll, this stretch immediately slips the other way and wrinkles result.

Top rolls should be set correctly in reference to the bottom steel rolls. The main object is to have the top rolls set directly over and parallel to the center of those on the bottom. If care is not taken in setting the top rolls and they are not in line with those on the bottom, bad work is sure to result.

For example, if one end of a top roll is set directly over the center of its bottom roll, while the other end is allowed to get set ⅛ inch forward of the center, then the surface of the leather roll will not bear evenly along its entire length on the steel roll. In truth, if it were not for the cushion effect of the leather, the rolls would touch each other only at one place. This effect is difficult to show clearly in a sketch, but Fig. 5, gives a crude explanation. End, *A*, of the top roll was set correctly, but end, *B*, was allowed to get set forward out of line. The weighting of the roll is applied at, *W*, and the result is that end, *A*, rises a trifle as end *B*, rolls forward and down. The point of contact between the leather and steel is close to *W*, and nowhere else. At 0-1, and 0-2, there will be an open space.

To prove this, loosen up a neb holding one end of a couple of top rolls and move it forward. Then note the lumps of undrawn roving that come through.

Most frames are now fitted with steel rolls having their flutes unevenly spaced to prevent fluting the top rolls. If the top rolls happen to be of exactly the same diameter as those on the bottom, they will flute just as quickly as if the spacing were regular. To absolutely prevent the fluting of the leather rolls, the steel rolls should have unevenly spaced flutes and the top rolls should be of a different diameter than the steel rolls. Then the flutes of the steel roll will always strike a different place on the leather as the rolls turn.

In setting steel rolls, always put the gauges between the roll bosses and not the stands. The stands may not be the same thickness throughout the length of the frame, and besides getting an incorrect setting, such an action puts a slight bend in the steel roll which in time will be apt to shear off.

Drawing frames are supplied with weight relieving mo-

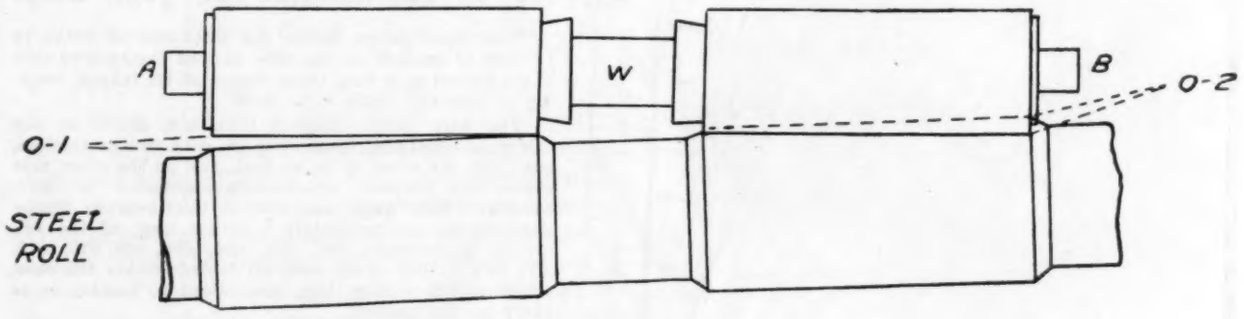


FIG. 5.

tions and the weights should be raised every Saturday. Slubbers, intermediates and other fly frames do not have this motion. However, if the department is to be idle for a week or more, unhook the weights on the fly frames and save the rolls.

Frequently overseers are cautioned to watch out for loose connections in steel roll sections. It is better to have these sections tight, but a bent steel roll is much worse than a loose neck. A bent roll has an eccentric motion which alternately increases and decreases the draft of the roving passing through the bent place. Don't allow a bent roll to continue in operation.

Sometimes a roll appears bent when it has been taken apart and reassembled incorrectly. The effect produced

on the work is identical with that of a bent roll. See that the marks on the square ends match those on the mortise ends when joining sections that have been disconnected.

When replacing steel rolls in their stands, it is very good practice to examine the bottom of the roll bearings and note that all brasses are in place. If a new brass bearing is installed, be sure that it is of the same height as the old bearing or the roll will be kinked.

Watch out that saddles do not become worn so as to fit tight on the roll necks and bind, thus preventing the top rolls from revolving freely. A back roll lagging in speed will produce light work. A front roll under the same circumstances, will produce heavy work. Do not use a light bodied oil on rolls or you will have them sticking continually. Use heavy shafting oil if you can't get any other.

When there are a number of different makes of frames in a mill, trouble is sometimes caused by getting top rolls in the wrong frames. The ends of the rolls may be too large to correctly fit the nebs on the cap bars, and the rolls bind and produce bad work.

Don't permit roller laps to accumulate on either top or bottom rolls, and don't allow the tenders to remove roller laps from leather rolls by means of a hook. Make them use their fingers. Occasionally the man in charge should look over the clearers and if the cloth is becoming worn, it should be replaced before it is a mass of useless rags. If possible to run without underclearers between front and middle rolls, do so, as it will let much dirt and short fibre drop out. If underclearers are used—and this also applies to top clearers—have them picked frequently so that the accumulation of waste won't pass through into the good work every now and then.

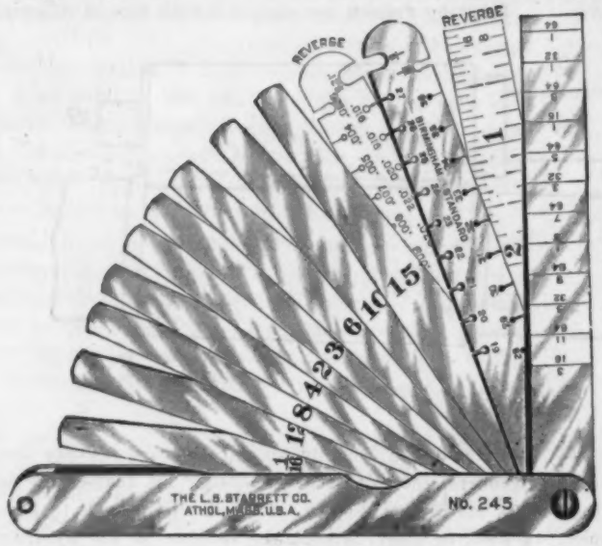
To many who read this article, there will appear nothing new, but there are always some who are beginners and some also who are not beginners that are desirous of adding to their store of information, and for these this article is written. Practical experience is a valuable asset, but there are some things that turn up so seldom in a mill that the man who depends upon practical experience alone for his knowledge, is often ignorant of a great many simple but vital things. *An hour's reading may and often does give more enlightenment on a subject than would years of work on the very machines themselves.* So while acquiring practical experience, don't forget to add a whole lot to it by reading about the other fellow's methods. He may have something better or simpler than your method. And, while you are profiting by his experience, you might tell a little of your own.

Most of the three thousand strikes occurring in the United States since we entered the war have been in industries manufacturing war materials. Over one million men have refused to work at various times and in a majority of cases have struck to enforce a closed shop. Sixty-four of these strikes alone caused a loss of 1,795,981 working days, or figuring 300 days to the working year, a loss of 6,000 working years. What the figures would be for the balance of the three thousand strikes is hardly conceivable.

Because of the congestion in the postal service the January Number reached the readers so late as to automatically disqualify all replies to the advertising contest in that number. The winner in the February contest will be announced next month.

Special Cotton Mill Gauge Free—

for a few minutes of your time.



The taper gauge shows the thickness in 64ths to 1/16ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

The wire gauge, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one 1/16, the other 1/8 on an inch, and on the other side shows the decimal equivalents expressed in thousandths. This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, 008, 010, .012, .015 and 1/16th of an inch all folded within the case, which is 4¾ inches long, convenient to handle or to carry in the pocket.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this gauge for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what manner, any certain advertisement is, in his opinion, the best.

Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible, and must reach this office not later than the first of the month succeeding the date of issue.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final. The name of winning contestant will be announced in COTTON'S pages.

Address Contest Department of COTTON, Atlanta, Georgia.

Dyeing, Bleaching and Finishing.

Calender Finishing.

BY WILLIAM B. NANSON.

A five bowled swissing calender (see illustration Fig. 1) may be used for a variety of classes of work but is principally used for swissing and chasing. Swissing means the running of cloth straight through the nips in series and represents the regular process of calendering when it is intended to merely smooth and face up, and brighten the cloth and to close up and flatten the threads to produce either a hard or mellow finish in conjunction with variable mixtures and quantities of starch and condition, which latter means degrees of dampness. When the goods are passed once through between any two rolls of a calender they are said to have one nip; when twice or between a further pair—two nips; or three times—three nips, etc. Thus the finish depends upon the number of nips given and the sequence of the bowls. For instance, referring to Fig. 1, if bowls 2 and 4 are of metal and all the others of cotton or paper, the goods will be highly finished on one side, if all four of the nips be given, but if 1 and 4 are metal and 3 cotton and 2 and 5 of paper, the goods will be highly finished on both sides. We may say here, in this connection, that all calenders should be so constructed that the bowls can be changed at will from one kind to another to meet all requirements. In this way any of the following combinations of bowls may be set up in a five-bowled calender and almost any kind of a finish may be obtained as may be required:—

	a	b	c	d	e	f
1	Iron	Cotton	Iron	Paper	Iron	Paper
2	Cotton	Cotton	Cotton	Iron	Cotton	Iron
3	Paper	Paper	Iron	Cotton	Iron	Cotton
4	Cotton	Cotton	Cotton	Iron	Cotton	Paper
5	Paper	Cotton	Paper	Paper	Iron	Iron

It will be seen from this that the sequence in which the bowls are arranged allows of many variations to suit the finish desired and it becomes a simple matter to mount the bowls so as to give any combination of nips which may be desired. Thus, for instance, with five bowls arranged alternately of cotton and metal as in combination "e" one face of the goods gets four cotton nips and the other face gets four metal nips as shown in Fig. 2. In this figure, the side of the goods marked B gets all the finish that can be given by one run through the calender and the difference between the finish or glaze of the two sides of the cloth is very marked. It may be said that a predominence of metal bowls in a calender makes for hard, bright appearances and well closed effects. For soft dull finishes combination "b" would be a very desirable combination of bowls to use.

The result of chasing (Fig. 3) is to give a thready appearance as well as to close up the threads and to give a firm, not hard or stiff, feel to the cloth.

Chasing implies the re-entry of the cloth through one or more of the nips through which it has already passed, so that there are simultaneously two thickness or layers of cloth at each nip, one of them passing through it for the first time and the other for the second time.

The process of chasing may be carried further so as to effect a double or treble or even more numerous chase so that in each nip there would be three or four layers of cloth pressing together respectively. The effect of this chasing is to produce a thready appearance on the contiguous faces of the cloth. The threads on such surfaces are pressed against each other, and in a way, emboss their form on each other. The tendency is to round rather than to flatten the threads, and at the same time the goods are closed up in texture. In this way the cloth may be passed

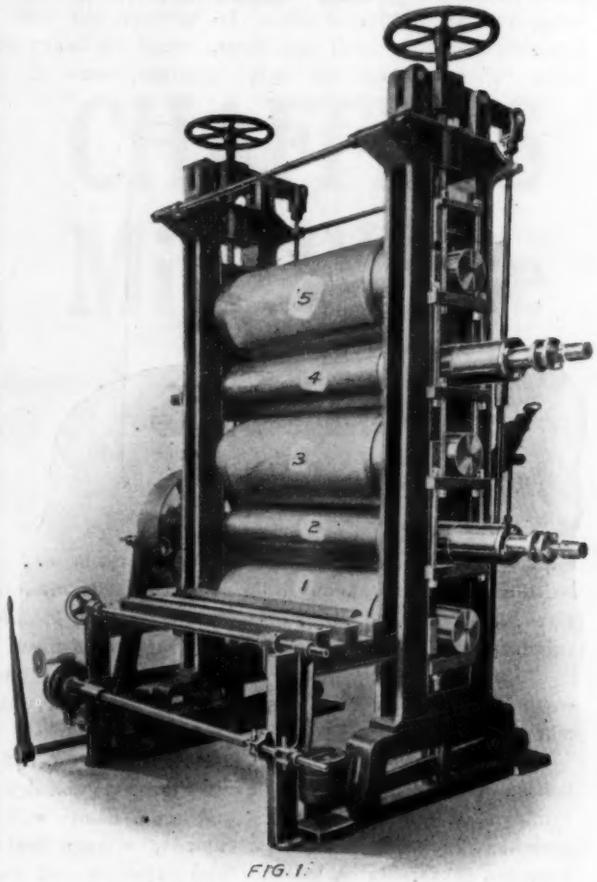


FIG. 1.

as many times as desired around the calenders. We may say here that the amount of pressure or "set" is affected by the superior weight, including that applied through compound levers upon a thrust block usually bearing upon the neck of the top bowl.

The pressure can be further increased by locking the upper levers and applying a dead set by tightening the thrust screws which communicate between the top lever and block. An even adjustment of pressure on each side of the bowl is obviously essential to acquire a uniform effect across the width of the cloth. The weight required on the driving side will be found, in practice, to be somewhat less than must be applied to the other side, but, in

any case the test for correct pressure will be found in the smoothness and tightness of the finished batch as it is wound upon the shell, a slack selvage indicating that the pressure on the calender is lighter on the slack side. It may, therefore, be inferred from this, that the degree of pressure, the composition and arrangement of the bowls, and the manner of the threading up of the cloth, are the main factors in determining the finish in so far as the mechanical treatment of the cloth is concerned.

Chasing goods on a five-bowled calender is often done to produce an imitation linen or beetle finish on white goods or light hollands for dress goods. It is also used largely on colored goods for Moire finish. Moireing or watering gives to the goods a pronounced wavy appearwhich is clearly watermarked so that the light falling on the piece becomes reflected differently by different threads or parts of the fabric and shows a watermark. When a piece of cloth is passed through a hot calender singly the whole surface is affected alike. If, however, the cloth is superimposed upon itself and chased round the heavy calender "e" with three hot metal cylinders, some of the vious calendering, and the length of time it is allowed to run.

Chesting and jacking require to be done on calenders especially fitted up for that purpose, so that the distance between the two top bowls can be varied in such a manner as to allow for the winding on of the goods. This finish is especially applicable to Hollands, fine window shades, etc. For white goods we may give the following as a sample receipt. The goods are mangled from the bleach house through boiling water on a heavy five-bowled mangle with cotton and brass bowls and then starched (wet) with a mixture of starch only at about 8 degrees Tw., and dried up. They are then sprinkled well and allowed to lay over two hours. Calender on chasing calender (Fig. 3) once round and then Jack on Jacking calender (Fig. 5), or on Chesting calender (Fig. 4). This finish is for a fine class of goods and is intended to closely imitate Irish linen.

Another finish for white goods much used in Germany and abroad is to mangle the goods from the bleachhouse and dry upon the cans. Then condition on the sprinkler, lay over two hours, chase on a chasing calender (Fig. 3)

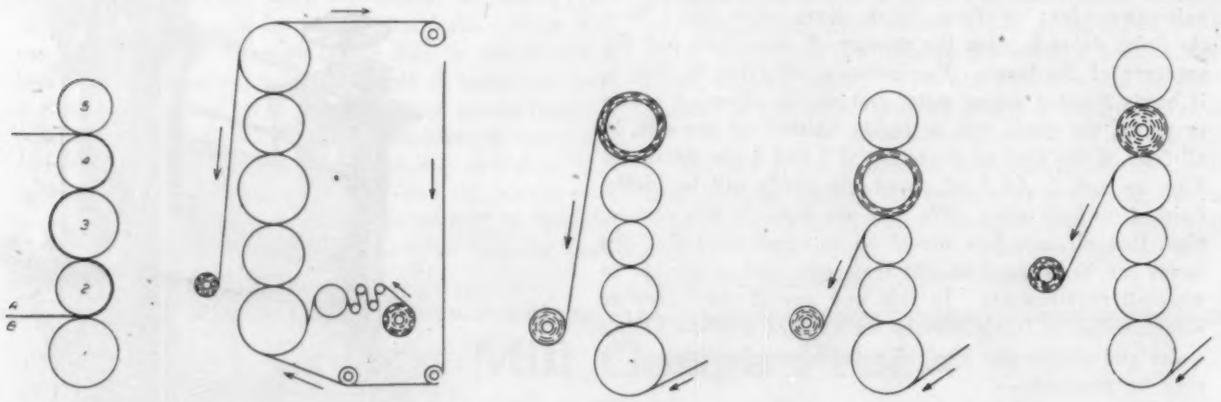


FIG 2 FIG 3 FIG 4 FIG 4' FIG 5

threads are glazed while the contiguous threads may not be affected at all, at any rate in varying degrees, this gives to the cloth the power of reflecting the light in different degrees and creates the Moire or watermark effect.

A high degree of heat, a heavy pressure and a damp condition are the prerequisites to a heavy and clear watermark.

The usual procedure when moireing goods on a five-bowled mangle (Fig. 3) is to starch the goods and dry on cylinders, starch and dry a second time, damp well on sprinkler, lay over two hours, calender without heat or pressure, preferably on calender with expander and wooden rolls, damp again, lay over, then chase about three times around on five-bowled calender "e" with hot cylinders and four nips.

A five-bowled calender may also be used for chesting (Fig. 4), and for jacking (Fig. 5).

Chesting gives a bright and thready finish. It is customary to swiss the goods first through four or more nips and then wind the goods, always under pressure, on to the top or second bowl as shown in Fig. 4 and 4'.

Jacking is done by winding the goods on to a loose bowl between two other bowls as shown in Fig. 5. It gives a bright thready, somewhat of a beetle finish, but not quite so bright as the chesting process. The threadiness will depend much upon the "condition" of the cloth, its preonce round with heavy set and much heat. Then starch through a china clay and starch mixing, dry up and condition as before, then jack or chest either as Fig. 5 or Fig. 4. We may say here that the starch mixture for this is usually, for 50 gallons: sufficient starch to bring it to 10 degrees Tw. about 6 gallons of china clay mixture, 5 pounds of dry mineral white, 12 pounds of dry barytes, and about 5 pounds of soap.

It must be remembered that all goods intended for chasing, jacking or chesting must have all seams cut out and the ends pasted together or the goods will be cut, also all creases and other inequalities must be carefully cut out for the same reason.

In chesting or jacking it is necessary to provide arrangements for running the bowl upon which the cloth is wound in either direction so as to be able to wind or unwind a batch at will, or, to transfer it from one roll to another, or, from the calender bowl to the batching shell.

In some cases the batches may be wound up on solid hardwood rolls or some other suitable machine, and introduced bodily between the bowls of the jacking calender, but this is not advisable as it is better to wind the cloth on under pressure in the calender itself for jacking.

In jacking and chesting great care must be taken that no creases or wrinkles are allowed to occur in the cloth or they will cut.

We may say that in a jacking calender (Fig. 5), the cloth passes through the nips of the three lower bowls, cotton, paper, and cotton, and is wound up tightly on a batch roller between the rolling surfaces of the upper cotton and top paper bowl as well as being in contact with the cloth in the batch. Meanwhile the goods in the batch continue under the same pressure, becoming closed and brightly finished. Probably the best method of applying the pressure is by hydraulics, because as the diameter of the batch increases, the hydraulic pressure remains the same as the increasing pressure caused by the increasing diameter is governed and kept uniform by the expulsion of water from the cylinders of the rams through a properly adjusted safety valve.

The following are a few examples of the various styles of goods which may be finished by the methods given for use on a five-bowled calender.

SWISSING.

To finish printed brilliantes, fine Scotch ginghams, figured piece dyed dressgoods, and many styles of fine bleached shirtings, damp first and calender heavily on five-bowled calender, all the nips; the thread is thus flattened and crushed and closed up; the goods are then starched on the back and dried up with the back only to the drying cylinders so as to throw up the figure or pattern, care being taken not to stretch the goods too much. After starching and drying the goods are rolled up two or three times to break them down without any further calendering.

In this case the calendering, which must be heavy, is done first and the starching afterward, so as to give a natural lustre to the finished goods without any appearance of calendering and to leave the pattern raised up prominently.

To finish sleeve trimmings, glazed furniture prints, etc.:—Starch on a three-bowled starch mangle using considerable wax (or paraffin) in the mixing, dry up and allow goods to cool off well. Damp well and lay over two hours. Calender twice on five-bowled calender, all nips, using heavy set and all the heat that can be got.

To finish sateens and satinettes, calender without starching and with various heats and pressures to suit the different qualities and colors. Some of these goods may be starched, damped, calendered highly, and then wet out again and dried and the finish and stiffness broken down to a natural satin look and feel.

For finishing black twill coat linings, cool off 25 pounds of rice flour made into 30 gallons of starch to about 130 degrees F., and add 5 pounds of diastofor dissolved in luke warm water. After liquefying, add 3½ pounds of glycerine, 2½ pounds of softening, 2 pounds of paraffin, and 10 pounds of magnesium chloride. Boil well and then add 25 pounds of epsom salts, dilute with water to the requisite consistency, starch the goods and dry up; cool off thoroughly, and damp well; allow to lay over two hours, and then calender twice on five-bowled calender all nips, heavy pressure and full heat.

It may be noticed that we always say "cool off thoroughly after drying before sprinkling" and "allow the goods to lay over two hours after sprinkling before calendering." This is important and quite essential to good even work, for, if the goods are hot, in all, or, in part, when taken to the sprinkler, the hot places containing as they do much electricity not only repel the water but what water does go in is dried up by the heat which makes the

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moisture and the subsequent finish quite uneven. Again, if the sprinkled goods are taken too soon to the calender the moisture has not had time to become absorbed evenly throughout the batch or to properly combine with the size and render it amenable to the action of the calender. It must be remembered that the primary object of the sprinkling is to soften up the size and render it plastic so that it will take the finish readily, and in many cases the secondary object is to add to the weight of the goods. In either case twice the quantity of water can be added to the goods if they are cooled off before damping and allowed to lie for sometime (at least two hours) after damping and before calendering. In all the various processes of finishing the condition of the goods before calendering, i. e., the drying and sprinkling operations, require the most careful attention, the most brains, and the widest experience.

For kid finish cambric.—This is a soft finished piece dyed print cloth 24 inches wide. The cloth has some lustre on both sides; but one side, which comes next to the metal bowls in calendering, is far more lustrous than the other. These goods are shown in black and all other shades. The finishing is the main feature that sells these goods and it needs to be a "kid" finish, i. e., the cloth must have a somewhat leathery feel and full, not hard or stiff. These goods must be bleached, dyed and dried up and allowed to cool, then damped on the sprinklers and allowed to lie two hours, then calendered on a five-bowled calender using a high degree of heat, but a light pressure. They are then filled on an ordinary two bowled starch mangle with starch made as follows:

. 120 gallons of water, 200 pounds of dextrine, 40 pounds of corn starch, and 10 quarts of soluble oil. The goods are then dried up, cooled off, damped, and laid over two hours and calendered again as before. It must be borne in mind that the greater the lustre required, the heavier must be the pressure and the hotter the temperature. Almost every different lot will require its own pressure and temperature in the calendering and for this reason no very arbitrary rules of procedure can be laid down.

We may say that this formula for finishing kid finish cambrics and many of the other classes of goods given, are the methods followed by the finishers abroad, where cloth finishing is reduced to a fine art. Here they often do it different, as frequently the converters wont pay the price for finishing the goods right.

Few finishers in this country even bleach their "kid finish" goods before dyeing and yet it is of the first importance if the finish is to be good.

We are doing much of our finishing here in the crudest manner, but it is also true that we are doing it for half the price that finishers abroad (say England for instance) are doing it for, and that must be our excuse, but it will most effectually prevent us from capturing the world's markets after the war is over as some of our economic optimists are claiming we will do. The outside world is, I have found, most exactingly and finically particular about the finish of its goods, and a half or whole cent more or less on the cost of the finish will not induce it to take a finish it doesn't want, or doesn't like. There is food for thought in the foregoing statement.

[This is the second of a series of articles on finishing which this author is writing for COTTON. Others will appear later.—Editor.]

The Metals Disintergrating Company.

Late in 1916 this company installed a plant for the production of metal dusts by a process owned and controlled by them. The works are located at Bound Brook, N. J., which is centrally located in relation to the various dye manufacturing plants, cotton mills and other manufacturers using zinc dust.

Zinc dust offered a most promising field, and during the 18 months which the company has been operating, they have continually improved the quality of their zinc-dust until at the present time they are turning out an exceptional product which they guarantee has a reducing power of 97 to 98 per cent, and all of which screens through a 200 mesh screen, 95 to 100 per cent passing through a 350 mesh screen. This product was developed to meet the needs of the dye industry, where the question of purity and fineness of raw materials is paramount. Uniformity, another essential feature from the consumers standpoint, is maintained by close supervision. Each cask of zinc dust is sampled before shipment, and factory records show that for the past three months the reducing power has not varied one-half of 1 per cent, and the screen analysis less than 2 per cent.

The Silesian zinc dust, which was in general use before the war, had a reducing power of about 90 per cent, and besides zinc oxide, contained other impurities such as finely divided carbon and some silcious materials from the retorts. It is evident that the Metals Disintegrating Company's zinc dust not only supplies the consumer with a product formerly imported from Germany, but the quality is far superior to the German product.

American dye manufacturers will have to practice rigid economy in their manufacturing processes, in order to meet the competition which is sure to develop after the war. High-grade zinc dust will help the manufacturer to lower his costs. The high purity of this product insures the consumption of the minimum amount of chemicals, such as caustic soda and acids. The chief impurity in ordinary zinc dust is zinc oxide, which wastes chemicals and produces no chemical action useful in the production of the finished material. The fineness of this zinc dust cuts down the time required for reaction, thereby cutting labor and apparatus costs, and above all insures the absolute consumption of the zinc dust. Increasing the yield of finished product per unit of zinc dust. Uniformity obviates the necessity for continually changing factory formulae, insuring a more uniform finished product.

Besides zinc dust, the Metals Disintegrating Company manufactures aluminum dust, lead dust, tin dust and magnesium powder. Aluminum dust, known as Pyro Aluminum, is used in the manufacture of fireworks and for war purposes. Lead dust is used in the manufacture of solder pastes, mixed with other metal dusts. Tin dust is used for manufacturing metal coated papers, a growing industry in this country. Magnesium powder is used for photographic purposes and for military signals.

The company maintains an efficient research department, and it is due to the painstaking work of their chemists that they have continuously improved the grade of their products. This department offers its services to the trade, and will co-operate with it on problems involving the use of any of their products.

Barrett Specification Roof with tile surface on Altman Building, New York City, being used as a drill-ground.
Architects—Trowbridge & Livingston, New York.
General Contractors—Marc Eidlitz & Son, New York.
Roofing Contractors—T. New Construction Co., New York.

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A Severe Test—A tile-surfaced Barrett Specification Roof being used as a Drill Ground

Hundreds of marching feet—a regiment in action with a roof for its drill-ground—that's what you see above.

You couldn't use a roof much more severely than this.

And that's what happened almost daily for months on top of the big Altman Department Store in New York City, where several hundred members of the Home Defense League have learned to do their "bit."

Barrett Specification Roofs contain a larger amount of waterproofing and protective materials than any other roof-covering.

That is why they give such wonderful service.

And not only do they give longer service than any other type, but they *cost less per yea of service.*

If you want this kind of a roof on your building, the way to make sure of getting it is to insert in your building plans the following:

> "The roof shall be laid according to The Barrett Specification dated May 1, 1916, and the roofing contractor shall secure for me (or us) the 20-Year Guaranty Bond therein mentioned."

Only competent roofers can obtain the Bond, and the roof is constructed *under the supervision* of a Barrett inspector, who sees that the Specification is strictly followed.

20-Year Surety Bond

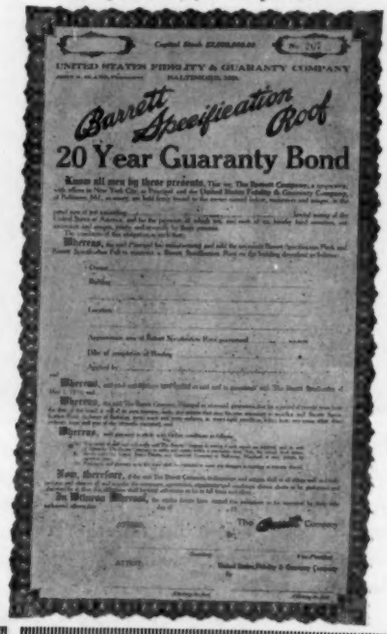
We now offer a 20-Year Surety Bond Guaranty on all Barrett Specification Roofs of fifty squares and over in all towns of 25,000 and over, and in smaller towns where our Inspection Service is available.

Our only requirements are that The Barrett Specification of May 1, 1916, shall be strictly followed, and that the roofing contractor shall be approved by us.

Barrett Specification Waterproofing

The foundation of this huge structure is also kept dry with a great seal consisting of alternate layers of Specification Pitch and Felt. This is the standard type of waterproofing for all important underground construction.

Below is the Bond that guarantees your roof for 20 years.


UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE, MD.

Barrett Specification Roof

20 Year Guaranty Bond

Know all men by these presents, That we, The Barrett Company, a corporation, with offices in New York City, N. Y., and the United States Fidelity & Guaranty Company, of Baltimore, Md., are severally and jointly bound to the owner named below, successors and assigns, in the penal sum of ... dollars, lawful money of the United States of America, and for the payment of which we, and each of us, bind our heirs, executors and assigns, jointly and severally, by these presents.

The condition of this obligation is such that,

Whereas, the said Principal has entered into and filed the accompanying Barrett Specification Pitch and Gravel Specification Felt roof, to succeed a Barrett Specification Roof on the following described premises:

Owner ...
Building ...
Location ...
Approximate area of Barrett Specification Roof guaranteed ... square feet
Date of completion of Roofing ...
Applied by ...

Whereas, said roof has been installed on said and is considered with The Barrett Specification of May 1, 1916; and

Whereas, the said The Barrett Company, Limited, or aforesaid guarantees, for a period of twenty years from the date of the final completion of the said roofing, such roof to be free from leaks due to defective materials or workmanship, and agrees to make such repairs, which, from any cause other than fire, may become necessary during said period, and

Whereas, said guaranty is made upon certain conditions as follows:

That the said roof shall not be used for any purpose other than as a roof, and the owner agrees to make no alterations in the roof or building which will in any way affect the roof without the consent of the Company, and to give immediate notice to the Company of any defect that may develop in the roof during the life of this guaranty, and to allow the Company free access to the roof at all times for the purpose of making such repairs as may be necessary under this guaranty, and to pay for all repairs made necessary by reason of the failure to comply with any of the conditions of this guaranty, and

Whereas, the said Company has agreed to make such repairs, and to pay the owner for any damage to the building or contents caused by leaks in the roof, provided the owner will pay to the Company the sum of ... dollars per square for the area of roof found to be defective, and will assign to the Company all claims against any person or persons responsible for such damage, and will render to the Company all reasonable assistance in the prosecution of such claims, and

Whereas, the said Principal has agreed to pay to the said Company, Limited, the sum of ... dollars per square for the area of roof found to be defective, and has assigned to the said Company, Limited, all claims against any person or persons responsible for such damage, and has agreed to render to the said Company, Limited, all reasonable assistance in the prosecution of such claims, and

Now, therefore, if the said The Barrett Company, Limited, or aforesaid, shall well and truly perform all the covenants and agreements of said guaranty on its part to be performed, and shall pay to the owner all damages which may be sustained by reason of any breach of the conditions of said guaranty, and shall pay to the said United States Fidelity & Guaranty Company all sums paid by it to the owner on account of any breach of the conditions of said guaranty, then this obligation shall be void; otherwise to remain in full force and effect.

In Witness Whereof, the said Principal has caused its seal hereto to be affixed, and these presents to be signed by its duly authorized officers, this ... day of ... A. D. 19...

The Barrett Company
By ...
ATTEST: ... Vice-President

United States Fidelity & Guaranty Company
By ...
ATTEST: ... Attorney-in-fact

A copy of The Barrett 20-Year Specification with full information will be sent free on request. Address nearest office.

The Barrett Company

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Cincinnati, Pittsburgh, Detroit, Birmingham, Kansas City, Minneapolis, Nashville, Salt Lake City, Seattle, Peoria

THE BARRETT COMPANY, Limited: Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S., Sydney, N. S.

Notes About Men You Know.

Erratum.

The unconfirmed report of a change in the officials of the Necronsett Mills, Inc., which was published in these columns last month, was entirely in error. The present officers are J. Frederic Houston, President, Andrew S. Webb, Vice-President, Rushton Marot, Secretary and Treasurer, and Clifton Corley, General Manager. Furthermore, no change in management is contemplated. This mill is located at Cumberland, N. C., and manufactures a high grade of combed yarns.

E. C. BENNETT, SUPERINTENDENT OF THE YARN SPINNING DIVISION OF THE AMAZON KNITTING CO., MUSKEGON, MICHIGAN, AT HIS DESK.

H. A. JAMES, of H. A. James & Co., Inc., Philadelphia, yarn commission merchants and selling agents for the Gray Manufacturing Company and Parkdale Mills, Inc., Gastonia, N. C., has been enjoying an extended trip of two months through the South, having coupled business with pleasure.

GEORGE FISH has resigned his position with the Jenckes Spinning Co., Pawtucket, R. I., to become general manager of the two mills of the Fort Mill (S. C.) Mfg. Co.

C. B. GUNN has resigned as superintendent of Union Cotton Mills, Lafayette, Ga., his resignation to take effect in the near future.

JAMES R. FIELD is to be promoted from the position of overseer of carding to superintendent of the Union Cotton Mills, Lafayette, Ga.

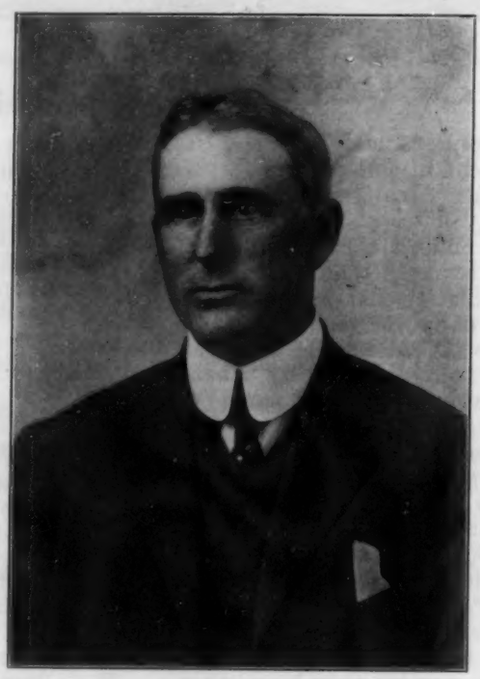
G. R. KENDRICK has resigned as carder and spinner at the Cannon Mfg. Co., York, S. C., to become superintendent of the Saxapahaw (N. C.) Cotton Mills.

JAMES B. KNIGHT has been transferred to position of night superintendent at Echota Mills, Calhoun, Ga.

W. B. MOORE, president and treasurer of the Mills Manufacturing Company, Greenville, S. C., died at his home on Augusta street on Tuesday afternoon, February 12th. Mr. Moore, while a man of unusual energy, has not been in good health for several years and the end coming suddenly and unexpectedly as it did, was caused from heart disease.

Mr. Moore was born in New Hanover (now Pender) County, N. C., about one mile from the famous revolutionary battle ground, "Moore's Creek Bridge." His grandfather, Gen. Jas. Moore, planning the battle that brought the first victory to the American arms, and that gave new life and encouragement to the heroes, who finally established liberty and freedom in all America. Mr. Moore was not brought up in the mill business, his father, James Pettigrew Moore, being a large land owner in eastern North Carolina, and it was rather a matter of chance that decided his destiny in this direction. Being born and raised in a malarial section his health broke down on entering young manhood and his physician advised him to go up in the Piedmont or mountainous section of the state, which he did, locating in the town of Mount Holly, near Charlotte, N. C.

As he was not yet 21 and had no business training, he taught school in this town for a term, being the principal of Mount Holly Academy, and while teaching he formed the acquaintance and later the warm friendship of A. P. Rhyne, a patron of the school, who was the owner of two or three mills and a pioneer cotton manufacturer. Mr. Rhyne persuaded Mr. Moore to take up the mill business,



W. B. MOORE.

explaining to him the opportunities for bright young men, and further, that few men of education were engaging in this line of work, which meant so much for the future development of the South.

Mr. Moore was impressed with Mr. Rhyne's personal interest in him and after due deliberation decided to take his advice by going in one of Mr. Rhyne's mills in March, 1890, and working throughout the mill learning the business. He applied himself diligently and at the end of a year. Mr. Rhyne gave him the position of superintendent, which was the first pay he received, having worked while learning without any compensation. He remained with

Pyrene
KILLS FIRE
SAVES LIFE

High Speed Production *and* Incendiaries *are* Creating *FIRES*– How to stop them·

Watch out for fire.——Incendiaries are getting in their deadly work, and factories are keyed up to high speed production which always means increased fire danger. Your cotton mill, warehouse, dock or plant may be next to go.

How to Prevent Fires——Do you know that you can practically abolish the fire danger?

Modern, high efficiency equipment has been developed which makes bad fires next to impossible. The Pyrene Company has spent many thousands of dollars studying fires. It has not only brought its famous hand extinguisher, Pyrene, to a high point of perfection, but has created a line of factory fire appliances equal in quality.

There are different kinds of fires and different types of Pyrene appliances. The line is complete. We list here some of the Pyrene equipment needed in the average industrial plant.

PYRENE'S NEW FIRE WEAPONS FOR FACTORIES

PYRENE FIRE EXTINGUISHER. 14 inches long, weighs 6 pounds. Non conductor of electricity, effective on all kinds of fires, including cotton fires.

GUARDENE CHEMICAL ENGINE (40 gallons). A factory size fire engine has saved many a plant from sure destruction.

PYRENE SAFETY CAN. This is a non-explosive can for the storing of gasoline, benzine, etc.

LINEN AND COTTON RUBBER LINED HOSE. Made in any length and labeled strictly in accordance with the requirements and specifications of the Associated Mutual Fire Insurance Companies and the National Fire Protective Association.

PYRENE WASTE CAN. This can is self-closing, thus eliminating the danger from sparks and spontaneous combustion.

GUARDENE Soda and Acid Extinguisher —Required in some risks by insurance and other regulations.

In addition to the foregoing items, the Pyrene Manufacturing Company manufactures and furnishes for immediate delivery: The Relc Stationary Chemical Engine, for protection of all buildings; all Fire Department brass goods; Fire Department supplies; Fire Department uniforms, rubber coats, rubber boots; first aid kits; industrial goggles; respirators; smoke helmets; warning and exit signs; extinguisher re-charges; fire pails; fire buckets. The Kaiser's fire fiends are loose. See that your factory is equipped to fight fire.

PYRENE MANUFACTURING COMPANY

52 VANDERBILT AVENUE, NEW YORK

Mr. Rhyne until the year of 1895, when he married the daughter of Capt. O. P. Mills, of Greenville, and subsequently with the cooperation of his father-in-law the Mills Mfg. Co. was promoted. He was afterwards elected vice president and general manager and, upon the death of Capt. Mills, succeeded him as president and treasurer of the company.

The Mills Manufacturing Company is one of the most successful cotton mills in the Greenville section and much of the credit for its success is due to Mr. Moore, who was recognized as among the ablest cotton manufacturers of the South.

Mr. Moore was a progressive, public spirited citizen who did his full share in supporting public enterprises. He was especially interested in the welfare of cotton mill workers and gave much time and thought towards beautifying their surroundings, providing for them comforts and taking precautions to safeguard their health. He also took a keen interest in the growth, progress and betterment of the city of Greenville. During the past year he gave faithful service as a member of the Park and Tree Commission, as a director and as chairman of the civics committee of the Chamber of Commerce. His interest and influence in these organizations was ever alive for anything which he thought would beautify Greenville or make it a better place in which to live.

E. J. Campbell, formerly overseer of spinning at the Toxaway Mill, Anderson, S. C., is now, overseer of spinning at the Courtenay Mfg. Co., Newry, S. C.

W. R. Owens, formerly overseer in the card room with the Courtenay Mfg. Co., Newry, S. C., has taken a similar position with the Mills Mill, Greenville, S. C.

R. P. Gibson, better known to the mill men as "Dick" Gibson, of Concord, N. C., has accepted the position of South Carolina representative of the Arabol Mfg. Co., of New York. For a number of years he has traveled North Carolina for the Carolina Supply Co., and is well and favorably known throughout that territory. His many friends wish him much success in his new work.

C. E. Stratford has purchased an interest and been elected treasurer and manager of the Eatonton Cotton Mills, Eatonton, Ga., and takes charge February 15. Mr. Stratford for several years had been superintendent of the Fidelity Mfg. Co., Charlotte, N. C.

W. C. Leak, president and treasurer of the Pee Dee Manufacturing Co., Rockingham, N. C., died last week at the Charlotte (N. C.) Sanatorium. He had been in declining health since last spring when he suffered a stroke of paralysis following an automobile accident. He was 54 years of age, and besides his prominence in the textile industry of the South, was active in financial and public life. He was vice-president of the Bank of Pee Dee, had been chairman of the board of county commissioners and chairman of the board of education at Rockingham.

W. J. Jenkins has resigned as overseer slashing and drawing in at Exposition Mills, Atlanta, Ga., and accepted position as weaving overseer at the Scottdale (Ga.) Mills.

J. J. Barrett has been promoted from overseer of spinning at Chadwick-Hoskins Mill No. 4, Charlotte, N. C., to superintendent of Mill No. 3.

P. A. Smith of Selma, Ala., has accepted position as superintendent of the Hopedale Mills, Burlington, N. C.

James Pharr has accepted position as overseer of carding at Gate City Mills, College Park, Ga.

Eugene Floyd of the Victor Mill, Greer, S. C., has accepted the position of overseer of weaving at Enoree, S. C.

B. B. Gossett, President and Treasurer of the Riverside Mfg. Co., and the Toxaway Mills at Anderson, S. C., One of the "Live Wires" of the South Carolina Cotton Mill Industry.

Frank W. Gurry, for the past two years superintendent at the Graniteville (S. C.) Mfg. Co., has resigned this position to become manager for the Maginnis Cotton Mills at New Orleans. These mills have for several months been on the quiet search for the right man for this position and in securing Mr. Gurry they have secured a man of well known and proven ability. In December, 1915, he was appointed superintendent for the receivers at the Graniteville Mfg. Co., a plant at that time staggering under an indebtedness of more than a million dollars; he leaves them clear of the receivership, practically out of debt, and with the stock quoted at ninety. It is also of interest to note in this connection that all cotton used was bought from month to month at the market, so that the good results obtained may be credited entirely to Mr. Gurry's manufacturing ability, aided by the Kaiser's war-time market.

J. R. Manly has resigned as overseer of carding at the Mills Mfg. Co., Greenville, S. C., to accept a similar position at the Appalache Mills, Arlington, S. C.

James A. Harris, Jr., for many years Advertising Manager of the White Company, has resigned to accept a commission as Captain in the Quartermaster Corps. Captain Harris has already assumed his military duties, having been assigned to Mechanical Repair Shop Unit No. 305. He will be succeeded as Advertising Manager by Millard H. Newton, who has been connected with the company's advertising department for the past five years.

C. T. Hamilton, president of the United Chemical Products Corporation, Jersey City, N. J., has been visiting the Philadelphia territory in the interests of his company.

T. J. Campbell, formerly with the Magnet Knitting Mills, Clinton, Tenn., has accepted the position of superintendent of the Kingsport (Tenn.) Hosiery Mills.

Van Court Carwithen of Philadelphia, sole representative of the Swift Spinning Mills, and the Muscogee Manufacturing Co., Columbus, Ga., has been enjoying a recent trip South visiting these mills .

Richard Johnson, traveling representative of Joseph Sykes Brothers, Ltd., card clothing manufacturers, Huddersfield, Eng., died recently at his home in Oldham, Eng. The immediate cause of his death was not given in the brief

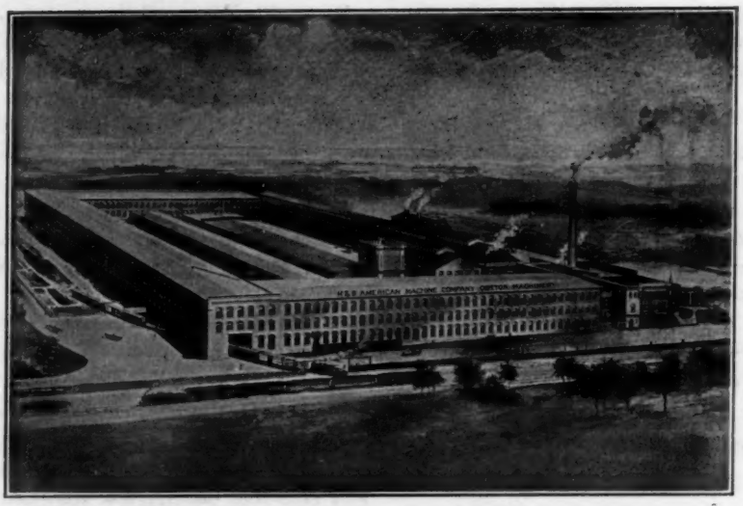
C. E. RILEY, Pres.
Boston Office
161 Devonshire Street

Southern Offices
814-815 Empire Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

cable received by Leigh & Butler, Boston, but a letter from his daughter received later states that he was very cheerful and was recovering satisfactorily from an operation Jan. 12, when his right leg was amputated. This operation was presumably the result of an injury sustained two years ago. He had been confined to his bed almost continuously ever since he returned from his trip to this country last September. Mr. Johnson was born in Yorkshire about sixty-five years ago. He had been with Sykes Brothers nearly forty years, advancing until his election as a director about five years ago. He first came to this country in 1886 to superintend the clothing of cards at the Amoskeag Manufacturing Company's mills. It was in 1895 that he became traveling representative of his company.

J. L. KANEER, son of J. W. Kaneer, superintendent of Highland Cotton Mills, High Point, N. C., has volunteered for the United States navy and is now on the waiting list.

T. P. FLANAGAN, the sales and advertising manager of the Pyrene Manufacturing Co., was the principal speaker at a luncheon of the Atlanta Advertising Club. Members of the Atlanta Salesmanship Club were also present as well as a number of Atlanta business men belonging to neither organization.

To go in four years, from business manager of a college paper to general sales and advertising manager of a million-dollar corporation, directing the work of more than 200 salesmen is going some, but that is the pace set by Mr. Flanagan, whose appointment to the chair left vacant by C. Louis Allen, now the company's president, has recently been announced by the Pyrene Manufacturing Company.

The directors of the company affirmed their belief in

T. P. FLANAGAN.

Young America a few months ago, when they elected as president Mr. Allen, then salesmanager, and only 32 years old. Mr. Allen's election attracted much attention in the business world. Now the company has affirmed its confidence in youthful aggressiveness by the appointment of Mr. Flanagan, who is only 25 years old, and has been out of college less than four years. They have been busy years, however.

Mr. Flanagan laid the foundation of his career at Trinity College in Hartford, where for several years he was

active in the management of both the college magazine and newspaper. During the same time he worked nights as a reporter on the Hartford Courant, and during the summer did police reporting. Following his graduation, Mr. Flannagan came to New York and went with the Wales Advertising Agency, which he left to become advertising manager of the C. J. Tagliabue Manufacturing Company, in Brooklyn. With the Tagliabue Company, Mr. Flanagan worked rapidly into the sales department, where he directed the work of about 20 salesmen and where he remained until 14 months ago where he joined Pyrene as assistant advertising manager.

Soon after he entered the Pyrene forces, Mr. Flanagan became assistant to Mr. Allen, then salesmanager, and when Mr. Allen's elevation left the head of the sales forces vacant the work devolved on Mr. Flanagan.

It is the belief of the directors that selling is essentially a job for a real man, vigorous, hard-thinking, hard-working, hard-hitting. And such they believe is more likely found among the younger generation.

Consolidation of Fibre Companies.

The incorporation of the Rogers Fibre Company under the laws of the State of Maine, with a capital of $2,500,000 is a forward step for the stockholders and interests of three well-known and successful corporations, whose activities and enterprises in the New England industrial field, are recognized throughout the United States and in many foreign countries.

The Rogers Fibre Company has purchased and taken over the plants, valuable water power rights, patents, goodwill, and business of the National Fibre Board Company, its mills at Bar Mills, East Poland and Kennebunk, Maine; the Leatheroid Mfg. Company, its mills and factories and water power at Kennebunk, Maine, and its stores at Boston, New York and Philadelphia; and the Mousam Counter Co., its shoe counter factory at Kennebunk, Maine. These three companies have long been under the same efficient management although operating separately and the consolidation is believed to be for the best interests of all stockholders through the merging of assets and greater economies in manufacturing, selling and distribution of its fibre products which include hard and soft fibre, insulating fibre, friction fibre, manufactured trunks, cases and fibre receptacles, fibre shoe counters, fibre innersoling, etc.

The officers of the new corporation are: President, Elliot Rogers, Kennebunk, Maine; vice-president, Louis Rogers, Portland, Maine; treasurer, Stephen Moore, Newton, Mass.; assistant treasurer, Eric O. Hallberg, Boston, Mass.; clerk, Eben W. Freeman, Portland, Maine; and general manager, Leon B. Rogers, Newton, Mass.

Each of the three companies merged has been individually very successful. The story of their beginnings and later developments has to do with the business acumen, integrity and foresight of a group of New England men in the creation of new and practical merchandise adopted as standards in many trades. The consolidation very appropriately occurs on the 50th anniversary of the first organization, for it was back in 1867 that the firm of Rogers, Edwards & Company leased a small mill at South Sudbury, Mass., and began the manufacture of leatherboard. The firm consisted of S. B. Rogers, Stephen Moore and Homer Rogers and two Edwards brothers, who soon after sold out to the other partners who continued business as S. B. Rogers and Company. A few years later leatherboard shoe counters were manufactured, the business subsequently being incorporated as the South Sudbury Mfg. Co.

In 1875 Emery Andrews, operating a fibre board mill at Welchville, Maine, consummated a consolidation with the South Sudbury Co. under the name of the Mousam Mfg. Co. This company was incorporated and built a new mill at Kennebunk on the Mousam river. In the eighties, the Mousam Mfg. Co. bought the Leatheroid Mfg. Company's property located at Philadelphia, with valuable patents, and removed the business to Kennebunk. In 1871 the National Fibre Board Co. was organized, which took over the Mousam Mfg. Co., the Hardwood Mfg. Co., of Leominster, Mass., and the Clegg & Fisher mill property at Lawrence, Mass. The managers of the Mousam Mfg. Co. were retained so that the affairs of the new corporation continued for many years under the general management of Emery Andrews, Stephen Moore and Homer Rogers.

In 1898 the Mousam Counter Co. was organized to manufacture leather and leatherboard cemented counters, constructed under the well-known James L. Hatch patents. This cemented counter was abandoned later when the present well-known Mousam "Horn Fibre" shoe counter was placed on the market.

In 1884 The Leatheroid Mfg. Co. began a separate corporate existence and has continued all these years the manufacture of hard fibre sample trunks, cases, and a long line of fibre receptacles for stores, factories and mills. Leatheroid electrical insulating fibre is also a product of this company.

The president, vice-president, and general manager of The Rogers Fibre Company are sons of the late Homer Rogers, one of the founders of the business, while Stephen Moore, the treasurer, has been identified with the business through all its changes since 1867. The main offices of The Rogers Fibre Company will be at 121 Beach street, Boston, which has been the office of the three merged companies for several years.

President Wilson's uncompromising attitude in his recent statement of our war aims shows he fully realizes the only way a successful outcome can be expected. This same idea holds true in business; no manufacturer who continually compromises in shop and mill can be really successful. He must be honest and careful in selecting both men and materials, if he wishes to go far in his trade. Wise textile men take no half-way measures in selecting their supplies; they know it doesn't pay in the end. So they get the best to be had. It is not unusual to find the progressive textile men using the special line of supplies made for them by the Arabol Mfg. Co., 100 William Street, New York City.

Booklet No. 354 entitled "Another Modern Link-Belt Gravel and Sand Producing Plant" and booklet No. 356 entitled "Link-Belt Sanitary Peeling Tables" are two new booklets which have just come off the press and are being distributed by the Link-Belt Company, 39th Street and Stewart Ave., Chicago, Ill.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Desires Information on Duck.

EDITOR COTTON:

I would appreciate it very much if the contributors to the "Discussion Department" will answer a few questions about duck weaving.

1. What is meant by the expression: "numbered duck"?

2. Are there any established standards as to the construction of "Army Ducks" of the various grades like 10 oz., 12 oz., etc?

3. Name some books dealing with ducks, ducklooms, etc. I have several good textile books but none of them mentions anything on this particular line.

Learner (Georgia).

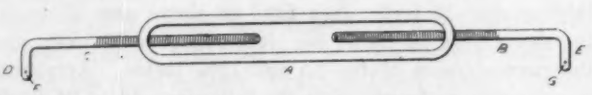
Taking up Card Flat Chains.

EDITOR COTTON:

Enclosed is a simple device for reducing the length of card flat chains after they have become worn. Flat chains on cards originally have 110 flats. After they have been run for some time the chains become worn, and the problem is to devise some means by which the chains can be taken up. The main problem has been, how can we hold the chain until we take out what is needed.

The device shown here will do the work. By getting on the back of the card, and taking out the second stand from the back, i. e., the stand that holds the flats up, and the stand that is used when grinding the flats with the drum roll grinder. Having taken out the stand, use the implement illustrated as follows: *R* and *E* are put into the holes of the flat chains, the flats having been taken off for a space of about 24 inches. *A* answers as a nut for *B* and *C*, which are threaded, right and left. Two of these devices are used, one for the right side, and one for the left side of the card.

When all is ready, turn *A* as if it was a nut or turnbuckle, and this draws up on the chains; take pains to draw



both at the same time so as to protect the chains from sagging or drawing too tight on the other stands; then by filing the burrs off the "cuffs" of the thimbles where the flat screws project, the little "cuffs" may be punched out, taking up the chains as much as is desired.

Ordinarily only one link of the chain may be taken out the first time. At some later time another may be taken out. Raising the stands will take up the chains considerably for a time, but eventually the links must be taken out.

Another thing to be considering is what are we to do when the chains give out because the flats are worn down to where they have to be re-covered with new fillet, before the chains themselves are gone. At such a time in place of having 110 flats re-clothed, we only have 108 because of chain take-up; then when the chains do give way, and the flats do not need re-clothing again, when we get new chains we are up against it for two more flats. This is because the new chain will only be as long as the old one with the two flats out, or about so.

Mine never has given away after taking them up the first time, but I think of some day when they will have to be taken up, and what a time I, or some other poor fellow, will have. To have two extra flats re-clothed for this job, will be a job, grinding them all down to the gauge of the old ones. The more cards we have the greater will be the job.

This is one subject that I would like to see discussed through the discussion pages of COTTON. Probably some carder has been through just this kind of a situation, and I know it would be intersting, and valuable to those who have not.

This little device for taking up card flat chains is simple and can be gotten up in most any mill machine shop. *E* and *D* are round iron about one inch in diameter threaded right and left. *A* is a turn-buckle threaded the same way (right and left). A little hole is made in the ends (*F* and *G*) to put in a nail to keep them from slipping out while working on the flat chains. This device overall is only about 30 inches. T. A. D. (Ga.)

Keeping Labor Contented.

EDITOR COTTON:

One of the many obstacles with which the manufacturer is confronted is that of keeping his employees satisfied, thereby avoiding disagreements and strikes. When an employer can keep his employees satisfied, he not only succeeds in avoiding labor difficulties but he is sure of keeping enough help at his plant to keep the machinery running to its full capacity.

In order to keep help satisfied it is first necessary to look after their personal welfare, not only at the plant at which they work, but in their homes as well. It is foolish to expect anyone to be contented at a plant if they are not getting enough salary with which to meet their daily expenses, because it is almost always the case that they will borrow money from someone else in an effort to live, and in some cases have a garnishment *presented and accepted* at the office. No one should even think of keeping contented help under those conditions. The writer does not believe in anyone being dishonest, but the manufacturer that will pay small wages and accept a garnishment against them from some money-shark is only cutting his own throat.

It is well to have foremen that will make every reasonable effort to see that the help in his department gets justice in their dealings with outsiders, as well as at

the plant, so far as it is in his power to do so. The foreman should be made to understand that he is not only at the plant to draw his salary and swear, but that it is duty to keep the help satisfied as far as is possible under the existing conditions.

There are of course many other ways that we can "help the help" other than the money question, as I well remember hearing the old saying, "Money does not make the Man." The foreman should keep closely in touch with each employee, study their individual problems, and see if he cannot make some suggestion that will save them time, labor and worry, and at the same time get just as good, or even better results. That's one of the very best ways of keeping contented help. Help them do their work in the easiest possible way that it can successfully be done.

One thing that I should have said before, is that any foreman to be successful *must* have the ability to make friends, and by all means be a good mixer.

Honest Bill. (Ky.)

Figuring the Pick Gear.

Several times lately inquiries have been made from readers as to the method of figuring the pick gear on looms when it was desirable or necessary to change the number of picks in the cloth being made.

When the number of picks per inch in cloth has to be changed, the only thing to be done is to put a new change or pick gear on the take-up motion, hence calculations for this motion are seldom made. However, there are one or two little points about this motion that are not as clearly understood as they should be, and for the purpose of making these points somewhat clearer, we divide the take-up motions as follows:

1. When the motion is driven from the bottom shaft and one tooth in the change gear is equal to two picks put in the cloth.

2. When the motion is driven from the crankshaft or lay sword and one tooth in the change gear is equal to one pick put in the cloth.

3. When the motion is driven from the bottom shaft and the calculation has to be made for change gear.

Figure 1 illustrates a train of gears driven from the bottom shaft in the loom. One tooth in the change gear will be equal to two picks in the cloth. A. is the ratchet gear of 100 teeth; B is the take-up gear of 17 teeth on the same stud. This gear meshes directly into the change gear C, of 24 teeth, which is on the sleeve of the pick sleeve gear D, with 21 teeth. This gear transmits motion to the cloth roll gear E, with 50 teeth. The circumference of the tin roller is 14¼ inches.

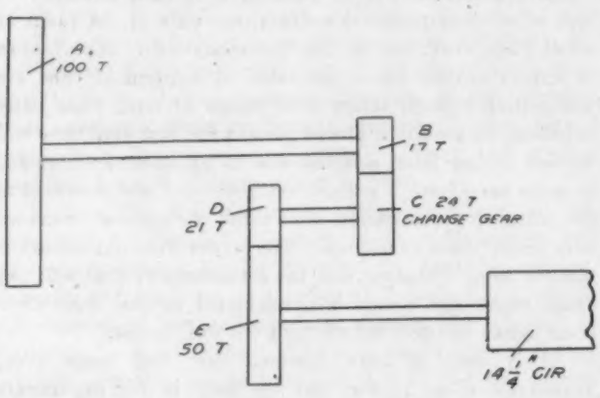


FIG. 1.

In take-up calculations, the circumference of the tin roller must always be taken into consideration and not the diameter of the roll. This circumference may be obtained by multiplying the diameter by the constant 3.1416. The driven gears are multiplied together for a dividend and the driving gears multiplied together with the circumference of the tin roll for a divisor. The result or quotient obtained by dividing the result of the driven gears by the result of the driving gears will give a number, which, multiplied by 2, will give the picks per inch.

The multiplier 2 is used because the motion is driven from the bottom shaft and one tooth in the change gear is equal to two picks. Figured out this shows as follows: $100 \times 24 \times 50 \div 17 \times 21 \times 14.25 = 23.58 \times 2 = 47.16$.

The change, it will be noted, has 24 teeth, so that there will be 48 picks per inch in the cloth. Now the calculation only shows 47.16 picks per inch, but as there is always a certain amount of slipping of the cloth and contraction after the cloth is taken off the loom, and as this is variously estimated at 1½ to 2 per cent, the picks will be right for the change gear.

In all take-up motion calculation, the ratchet gear is a driven gear and the circumference of the tin roll is considered as a driver.

Somewhat the same arrangement of gears is used when the motion is driven from the crankshaft or lay sword as

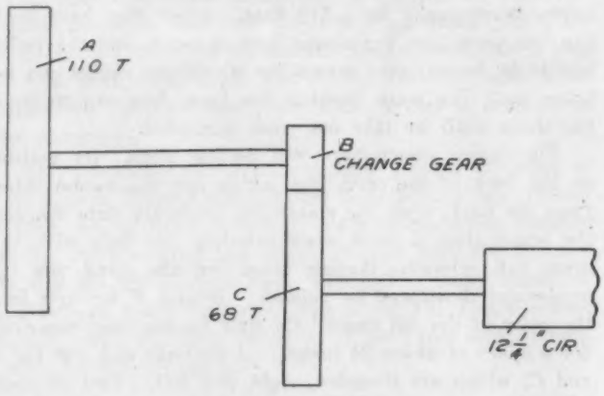


FIG. 2.

given in example 2. In this case the change gear is generally the ratchet gear. The following gears are used on one of these motions. Ratchet gear (change) 46 teeth; take-up gear 12 teeth; gear fixed on sleeve gear 35 teeth; the sleeve gear 12 teeth; the cloth roll gear 60 teeth, and the circumference of the tin roll 13⅜ inches. Arranging this example in figures gives the following: $46 \times 34 \times 60 \div 12 \times 12 \times 14.375 = 45.66$. The take-up gear has 46 teeth for that number of picks per inch in the cloth. The calculation allows a little under that amount, but when allowance is made for slippage and contraction of cloth from the loom, there will be 46 picks per inch in the cloth.

Figure 2 illustrates the train of gears when motion is imparted as stated in example 3. These gears require a calculation to show the number of picks per inch put in the cloth as the change gear does not indicate the number of picks per inch. To save time, a list of gears should

be made showing the number of picks each gear will give. Sometimes the calculation is made by proportion, using the gear on the loom with the picks in the cloth and ascertaining what gear will be required for another number of picks. This, however, is not very satisfactory, because it is not always possible to get the exact change gear.

With the train of gears in the illustration, in order to find what change gear can be used for 64 picks per inch the calculation would be as follows: In this calculation the picks per inch are substituted for the change gear. The answer is multiplied by 2, because the motion is driven from the bottom shaft. In figures this shows as follows: $110 \times 68 \div 64 \times 12 \times 12.25 = 9.542 \times 2 = 19$ tooth change gear.

The size of the tin roll has a decided influence on the number of picks per inch. Any variation in the size of this roll will have a corresponding variation per inch placed in the cloth. This is a point that should be carefully watched, especially when old tin rolls have to be recovered. In recovering tin rolls, the old perforated tin should always be taken off before putting on the new tin.

If this is not done, the new tin covering being put over the old covering will increase the diameter of the roll and this will cause the cloth to be pulled down faster, with the result that a less number of picks per inch will be put into the cloth than is called for by the change gear.

If the circumference of the tin roll is increased in any other way, the change gear and the picks per inch in the cloth will not correspond. When sand rolls are used, and at one time they were more in use than at the present, the surface would gradually rub and wear off. When recovered with this sand, which is a combination of grit, small particles of glass, etc., the circumference will be made too large if care is not taken when doing this work.

When recovering an old sand roll with perforated tin, all the old sand must be cleaned off the roll, otherwise an uneven surface will be left and this will show clearly in the cloth by making it uneven.

Perforated tin is now used almost exclusively for cotton goods, but on the finer grades of goods extreme care is required in the selection of this covering so as not to damage the cloth when winding it on the cloth roll.

On plain goods the take-up pawl should be set to turn the ratchet gear when the harness are level. At this point the yarn and the cloth has the least strain upon them. The most strain is on the yarn when the harness shafts are wide open and if the take-up motion operates at this time an additional strain is put upon the yarn.

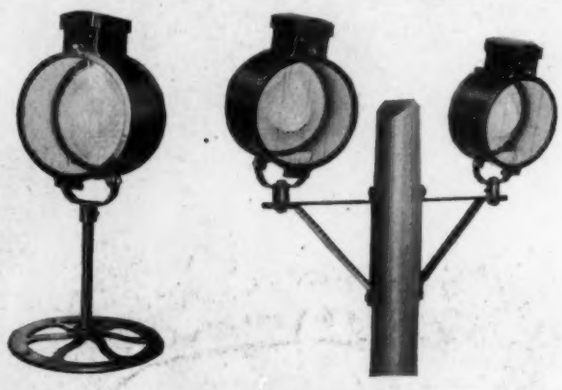
The foregoing constitutes a very practical answer to the question submitted and is taken from a book recently off the press entitled "Practical Loom Fixing" by Thomas Nelson, Director of the Textile Department, North Carolina State College of Agriculture and Engineering, West Raleigh, N. C. The foregoing facts given constitute Chapter VIII of this book. The price of the book is $1.25 per copy and it may be secured direct from Prof Nelson.

Testimony before the Senate Commerce Investigation Committee showed that up to January 1st, through strikes alone, the Government's ship-building program had been delayed 536,992 working days since the United States entered the war, or in other words the work of 20,000 men had been lost for thirty-days.

Night-Time Protection.

Cotton and textile mill superintendents are giving serious thought to the subject of night-time protection. With many mills working on Government orders it is of vital importance to protect the plant at night.

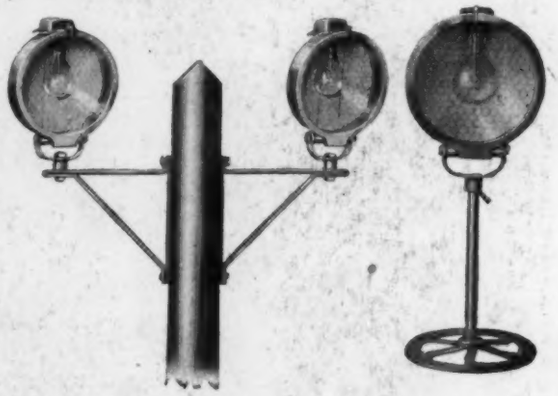
In guarding against the dangers of darkness the most effective weapon to use is the natural enemy of darkness—light. When daylight fades, artificial daylight—electricity—should be used to take its place. The need of an electric



THE 1000-WATT UNITS.

fixture to take care of this exacting service has resulted in the development of the electric flood lamp, now used extensively for this class of work. By proper installation, these lamps can be made to solve any protective lighting problem. The light they give will bathe the buildings, grounds, entrances, fences, etc. in electric daylight through which no prowler could enter without being detected.

The fixtures known as the Western Electric Davis Flood Lamps are well adapted to the needs of cotton and textile mills. These lamps are made in two models—a 1000 watt unit for long range lighting and a 500 watt unit for short throw or "close-up" work. Both models are supplied in either portable or bracket types. The bracket, which is

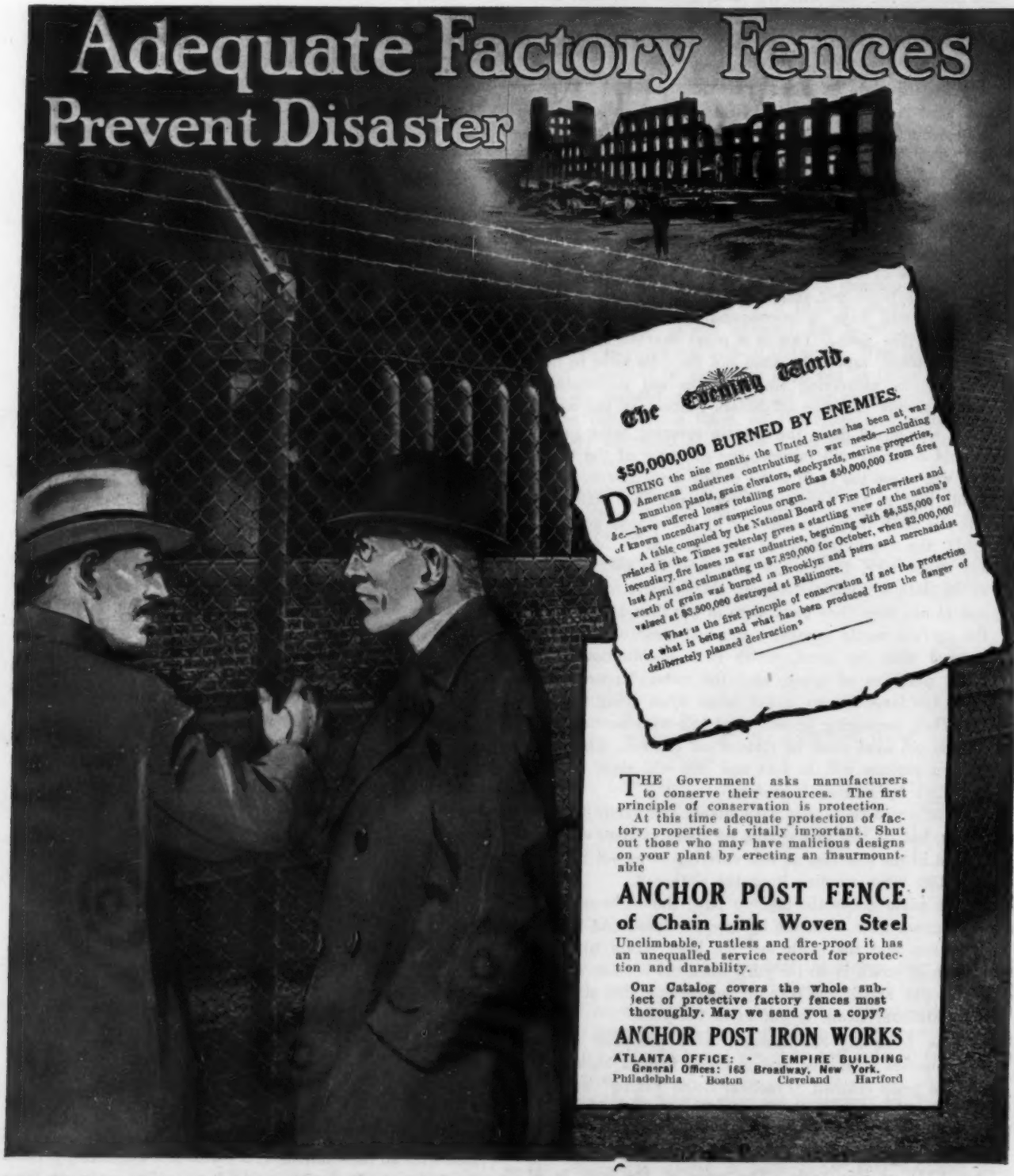


THE 500-WATT UNITS.

used with all installations of a permanent character, permits the lamps to be easily mounted on poles, walls, or trees where they give maximum distribution over a wide area. The portable style is recommended for temporary lighting. Both of these types use the standard Mazda lamp and can be operated on either alternating or direct current circuits.

Flood lighting can be effectively used as an aid to increased production. With proper arrangement of lamps a lighting effect can be secured that will enable work to

Adequate Factory Fences Prevent Disaster


The Evening World.
$50,000,000 BURNED BY ENEMIES.
DURING the nine months the United States has been at war American industries contributing to war needs—including munition plants, grain elevators, stockyards, marine properties, &c.—have suffered losses totalling more than $50,000,000 from fires of known incendiary or suspicious origin.
A table compiled by the National Board of Fire Underwriters and printed in the Times yesterday gives a startling view of the nation's incendiary fire losses in war industries, beginning with $6,555,000 for last April and culminating in $7,820,000 for October, when $2,000,000 worth of grain was burned in Brooklyn and piers and merchandise valued at $3,500,000 destroyed at Baltimore.
What is the first principle of conservation if not the protection of what is being and what has been produced from the danger of deliberately planned destruction?

THE Government asks manufacturers to conserve their resources. The first principle of conservation is protection.

At this time adequate protection of factory properties is vitally important. Shut out those who may have malicious designs on your plant by erecting an insurmountable

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be carried on as easily at night as during the day. Flood lamps thus insure maximum production as well as perfect protection. A set of them should be part of the equipment of every modern cotton textile mill.

A Notable Birthday.

From a business in whale oil of a few thousand dollars yearly, 65 years ago, to a business in scientific lubricants which runs into the millions, is the enviable record of the Swan & Finch Company, which has just celebrated its 65th birthday.

The Swan & Finch Company is one of the oldest and largest manufacturers of special oils and greases in the United States. Its business was started way back in February, 1853, in a small building at 44 Water Street, New York City. It has grown, until today the main plant of the company, at Bayway, New Jersey, covers over 15 acres, with piers at which tank boats and even ocean-going steamers dock.

The original business of the company was in the sale of illuminating oils and lubricants such as were used in 1853, consisting of fish and animal oils, spern and other whale oils, sea elephant oils, black fish and lard oils. These products were marketed at that time, chiefly through the wholesale grocers of New York City.

The company was among the first to refine menhaden fish oil one of the products of its own fishing fleet, and is still the largest concern in the world in this line of business.

When the use of refined petroleum for lubricating purposes was discovered, this concern was one of the first to market mineral oils as lubricants, and to manufacture lubricating greases with a mineral oil content. The further development of the company corresponds in a large measure with the later developments in the science of lubrication.

The company was the first to build up a world-wide business in oils for the lubrication of marine engines, and the Atlas trade mark, one of the oldest oil trade marks in existence, took its name, in fact, from the old Atlas line of steamers, to which it sold the first of its products.

Special oils for use in railroad work, was also a large factor in the growth of the company whose development along engineering lines has been such that for special purposes alone, its products are sold throughout the world, in no less than 103 industries.

Its various special products, developed for special purposes, have been placed on the market through its various branch offices, agencies and jobbers, under the old Atlas trade mark, and latterly, each with its own separate trade name.

Slo-Flo, for instance, a special product developed for textile mill machinery, has been found highly valuable for many other uses. It is particularly adapted for use as a lubricant in textile machinery, for roller bearings, line shafting, electric motors, printing machinery, and other special purposes where a slow-flowing lubricant is required. Cupase, Gearese, Textul, Aerul, Motul, Asbestese, Corul, Marinul and Talese, are the names of other special products developed to meet certain specific requirements, necessitated by the advances in science and manufacture.

The other products of the company, included under the Atlas trade mark, are a complete line of engine oils, cylinder oils, turbine oils, dynamo and motor oils, crank case oils, transformer oils, cutting oils, tempering and quenching oils, leather oils, spindle, loom and wool oils, and fish oils,

The company has also marketed a number of high grade special oils for soap and leather manufacture, and many vegetable oils such as peanut, soya bean, cocoa nut, etc.

Today, the Swan & Finch name and trademark are being blazoned far and wide, by national advertising in general magazines and special trade papers, and it is possible to buy the products of the company through its agents in almost any city in the world.

It can probably be said that the entire development of the company has come from the "service idea" in the effort to develop for its customers, special products definitely suited to the peculiar needs of each. The company now maintains a corps of chemists and field engineers whose duty it is to analyze the needs of each of its customers, and supply from its store of information the special product required, and where necessary to develop new products to meet new needs.

The Mechanics & Metals National Bank of New York, the president of which, Gates W. McGarrah, is also president of the New York Clearing House, has prepared a booklet which is being sent to banks and business organizations throughout the country, outlining a plan for converting non-essential industries of the nation to a war basis on a gradual instead of a drastic scale. The bank takes sides against the policy that is being agitated of complete self-denial on the part of the American people. It points out that war expenses of 1918 will equal not more than 30 per cent of the American people's income, and goes on to say:

"The nation can afford no negative economy. What it can afford is a curtailment of all unnecessary spending, and a wise and wasteless use of our resources. Sacrifice that means self-punishment would be ruinous in the long run; business depression and starved minds and bodies would not go far in contributing to win the war. The kind of thrift that makes for serious depression in business is wrong. Our supreme duty lies in keeping our affairs, our bodies and our minds vigorous and wholesome. If we are to have a long drain of war, and are to be triumphant, our country requires of us commercial and financial strength, and moral and physical strength as well."

A copy of the booklet will be sent on request.

Cotton plays a large part in the manufacture of tires, for the basis of a tire really is cotton, and not rubber, as is commonly supposed. The "carcass" or foundation of an automobile tire is built by the tire maker on a core or circular mold, by superimposing several layers of cotton fabric, cut on the bias, over this mold. Egyptian cotton has been found the best grade of cotton for tire manufacture, because of its long staple or fibre. However, when not properly stored it is particularly subject to damage by heat, heavy dew and rain. When damp, cotton does not work up properly. To insure a cotton supply in prime condition, The Goodyear Tire & Rubber Company has erected a storage building at its cotton fabric mill, at Goodyear, Conn., that will accommodate ten thousand bales at one time. Cotton is stored in this warehouse under the best of conditions, and when desired for use in making fabrics, is in perfect shape.

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The Schoolmaster of Trade.*

What have the exporters, the merchants, and manufacturers of the United States to learn in the matter of overseas trade in order that they may compete with the European countries when peace is restored? And if there be much (or little) to learn, who is the proper schoolmaster? As applicable to the Latin-American trade, how shall these questions be answered?

Manifestly, as referring to the future, answers to the questions involve conjecture as to what that future will be. The European War will undoubtedly bring many changes to the world, even to the world of commerce and business. The future will not be what the past was. Production and distribution will be in some measure changed. The commercial world—and the political as well—in both the warring countries and in the countries not at war, is guessing as to what these changes will be and the measure thereof. Such guesses, if shrewdly made, are the great strategy of international politics and of international commerce as well. But like all strategy of peace or of war, it must be based upon a correct view of the past and the present. To guess intelligently what will be, one must know not only what is but also what has been.

If the exporters, the merchants, and manufacturers of the United States in the past have proven themselves less resourceful, less energetic, less competent, in fact in any way inferior to their German, French, or English rivals in Latin-American trade, then manifestly they needed to go to school. The only thing worth considering was to find the best schoolmaster. If, again, the exporters of the United States have failed in the past, then in all probability they will fail in the future; and so they still need the schoolmaster. Offhand this failure in the past has been assumed by a large section of the American press, and Germany has been pointed out as the proper schoolmaster. Wonderful stories have been and are yet being told of German commercial success in Latin-America. The spreading of such stories is and always has been part of the German program. It creates an atmosphere, which is supposed to have a depressing effect on rivals. The English, French, Italian, or American exporter, and in particular the latter, is apt to be reticent about what he is doing in foreign countries. Not so the German. He claims everything "and then some," if one may use slang. As illustrating this, some time ago a story was cabled from Buenos Aires to the effect that agricultural machinery from the United States imported into Argentina since the war was giving great dissatisfaction; that German machinery used prior to the war was much better made and more suitable to the country. This story, with much detail as to why the German machinery in general use in Argentina prior to the war was better, was published in a number of American papers with no comment whatever. Other stories of a like kind showing dissatisfaction with American products or methods, as compared with German, are coming every day, and are being printed in the leading papers of the United States. What are the facts? Briefly, that Germany prior to the war had no hold whatever on Argentina agricultural machinery imports. She had been ousted from this field more than 20 years ago—horse, foot, and dragoons. American machinery had done the ousting, because it was better made and more suitable to the country and the crops. The trade was more intelligently handled by American exporters, and as a consequence they secured it. Prior to the war, Australia and England were still making a bid for this trade, but Germany was dead and buried. Yet outside of the exporters (i. e., the United States Harvester Co.), but few people knew the facts when they read this paragraph, and the Harvester people didn't think it worth while to talk.

On the surface, German commercial methods in Latin America appeared to be successful, but when examined closer the fabric was seen to be somewhat shaky. In teamwork (i. e., the coordination of all elements in furtherance of the single purpose to secure trade for Germany) the structure appeared perfect, if one left out of consideration the ethics of the case. Not only did the structure appear perfect, but every kind of a side prop was used. In Germany the manufacturers, the banks, the producers and importers of raw material, the trade and industrial schools, the newspapers, the universities, the selling agencies, the railways, and even the labor organizations all moved in one groove, and that groove was chiseled out by the German Government. A tariff system was devised which effectively assisted German over-seas trade, both imports and exports, and at the same time protected German home industries. The whole nation marched as one man. The organization was not confined to Germany; it extended abroad. It took in the steamship lines and German banks, and merchants wherever located. Its scouts were in every field. Its influence was seen and felt in enterprises not ostensibly German. In Latin America wherever there was a German there was a propagandist of German methods and trade. Nothing was neglected. Every influence, social, sentimental, commercial, or political, was used for the benefit of German trade or to the inquiry of German rivals. Over all was the

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Against this perfected system the individualism of the United States or of England or France might have seemed impotent, but it did not prove so. Before the outbreak of the war German trade was gaining nothing, at least nothing worth the while, in Latin America as against the trade of the three countries mentioned, or for that matter against the trade of any other commercial country—Belgium, Holland, Italy, Spain, etc. In fact, Germany was losing ground slowly but surely. The German machine, effective as it has proven itself in war, was not effective in peace. To the superficial observer this may not have been apparent, and if one must judge from the loud boasting of the Germans—not apparent to Germany—but this latter does not follow In fact there is much to show that thinking Germany realized before the war that German trade and industry was playing a losing game. To understand how Germany was losing trade in Latin America one must view the field, both territorially and also from the standpoint of the commercial progress of Latin America itself. Was Germany or any other country outstripping its rivals in territorial trade gains? Most certainly not Germany. On the contrary, the United States, beginning at the Mexican border, had extended its trade, both import and export, prior to the European war, over Mexico, Central America, the adjacent West Indian Islands, and down into South America, almost completely ousting Germany and all other countries therefrom. With tentacles far flung the body of American trade was slowly but surely creeping southward, keeping pace with the progress of the countries themselves and overwhelming, step by step and country by country, English, German, and all other European trade. Meanwhile, American news and trade papers and American economists and politicians joined in chorus, led by the German choirmaster, all singing the praise of German endeavor in Latin America.

Brazil, Bolivia, Paraguay, Uruguay, Chile, and Argentina were the strongholds of the German trade. Here, if anywhere, is to be found that so much heralded German commercial success. Yet German exports after 30 or 40 years of endeavor represented less than one-fifth of the imports of these six countries, less than 70 per cent of the imports from the United Kingdom (without colonies), and only about 25 per cent more than the imports from the United States. The figures in 1913 were: United Kingdom, $255,034,179; Germany, $175,744,271; United States, $141,540,585.

The center of the German effort to capture Latin-American trade was in Argentina, and German exports to Argentina represented nearly one-half of the whole of German exports for the six countries, including Argentina, and nearly one-third of the total to the 20 countries of Latin America. German exports in 1913 represented 16.9 per cent of the total of Argentine imports for that year. The percentage for 1910 was 17.4; for 1911, 18; for 1912, 16.6.

The following table shows the percentages that the imports from the seven leading commercial countries bear to the total Argentine imports for the years 1883, 1893, 1903, and 1913.

Countries.	1883	1893	1903	1913
United Kingdom	38.3	32.7	34.2	31.1
Germany	8.7	9.4	13.0	16.9
United States	6.1	7.9	12.7	14.7
Italy	4.3	4.2	11.2	8.3
France	19.2	17.8	9.7	9.0
Belgium	4.1	7.7	4.1	5.2
Spain	4.7	5.0	2.7	2.9

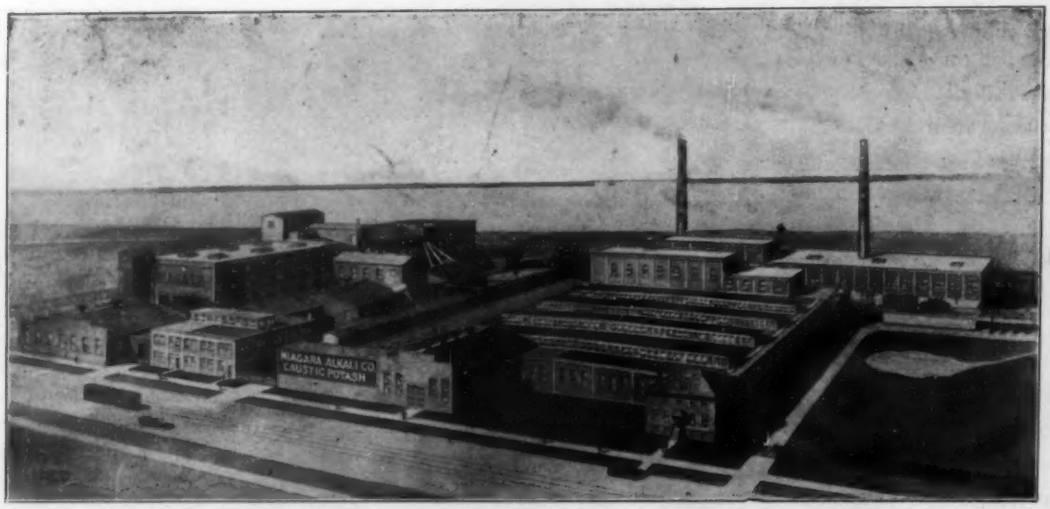
The table shows a large and progressive growth in German trade for 30 years, gained almost entirely at the expense of France. The apex of German trade was in 1911—United Kingdom, 29.6; German, 18; United States, 14.3; Italy, 8; France, 10.4; Belgium, 5.3 and Spain, 3.1. In 30 years Germany increased its proportion of the Argentine trade 94 per cent, Italy 94 per cent, and the United States 141 per cent. All the other countries except Belgium lost, France most heavily. When one considers that in Argentina, the very center of German trade activity, the United States made progress at a pace 50 per cent greater than Germany, one begins to lose faith in the story of wonderful German trade efficiency. If, however, one goes a little deeper into the character of the trade, he begins to see that the truly wonderful story is that of the advance of United States trade. In 1883, 52 per cent in values of United States exports to Argentina were spirits of turpentine, unwrought lumber, and kerosene oil. There were some plows, agricultural machinery, and unbleached cotton cloth, and these represented the bulk of the articles which competed with German or English goods. In 1913 turpentine, lumber, and kerosene represented only 22 per cent, and nearly all the remaining 78 per cent was of competing goods.

So that we see that even in Argentina, the stronghold of German trade, the United States advanced more rapidly than Germany, notwithstanding the perfection of the German machine centered there, with its steamships, banks, and traders, the United States having neither ship nor bank and scarcely a trader in the country.

Both Germany and the United States are new entrants in the race for over-seas trade in manufactues, but Germany was first in the field. German manufactures were pouring into Latin America from Mexico to Argentina in competition with English and French goods years before the United States was shipping anything to these countries, except flour, codfish, lumber, and the like Yet in 1913, prior to the outbreak of the war, the United States had passed Germany in 14 of the 20 countries of Latin America—that is, the United States exceeded Germany in exports to these 14 countries in the ratio of more than 4 to 1—$187,412,096 to $43,822,005. In the remaining six countries (Argentina, Brazil, Chile, Paraguay, Bolivia, and Uruguay) the United States trade was over 80 per cent of the German trade—United States $141,540,585. Germany $175,744,271. For the whole 20 countries the United States export trade (Latin American imports in the table following) exceeded the German exports in the proportion of 3 to 2. This scarcely looks like the American business man needed the German schoolmaster prior to the war.

In reading the table it must be remembered that it is compiled from Latin American official statistics converted into United States money and that "imports" and "exports" are from the Latin American standpoint—i. e., imports into the several countries of Latin America and exports therefrom.

Figures are sometimes quite eloquent if one knows how to read them, but they never tell quite the whole story.



The Home of Liquid Chlorine

Success brings its own reward, and the success of Liquid Chlorine has been remarkable, although it has been on the market but a very short while.

Liquid Chlorine is a distinct advance in bleaching agents. Its advantages over the old method of bleaching are so many that the mills that have adopted Liquid Chlorine would be loath to return to the old method.

By the use of Liquid Chlorine the entire quantity of chlorine agent is available for bleaching purposes. 100 pounds of Liquid Chlorine produces 100 pounds of available chlorine, of 100%, as contrasted with 35% of bleaching powder.

Liquid Chlorine

comes in steel cylinders, containing 100 lbs. of chlorine, held in liquid form in the cylinder by means of pressure. The cylinder is provided with a valve which on being opened allows the chlorine to escape in the form of gas. This gas is conducted by a pipe into a solution and it dissolves completely into a clear 100% bleaching agent that contains no sediment or sludge.

Yarns and cloth bleached with Liquid Chlorine have a much softer feel and a positive increase in the tensile strength of the goods is obtained. Less acid (or sour) is required which eliminates tendering and also results in a large saving in the amount of wash water required, and no odor is apparent in the goods.

You need no material changes in your present method of bleaching to adopt the Liquid Chlorine method. It is far simpler and easier to handle. It is a nicer, cleaner, more efficient and scientific method.

It is more economical, not only from the quantity standpoint, but from the standpoint of freight charges, as 1 pound of Liquid Chlorine is equal to 4 or 5 pounds of bleaching powder.

We'll be glad to send our representative to your mill and demonstrate Liquid Chlorine. All you need do is to ask.

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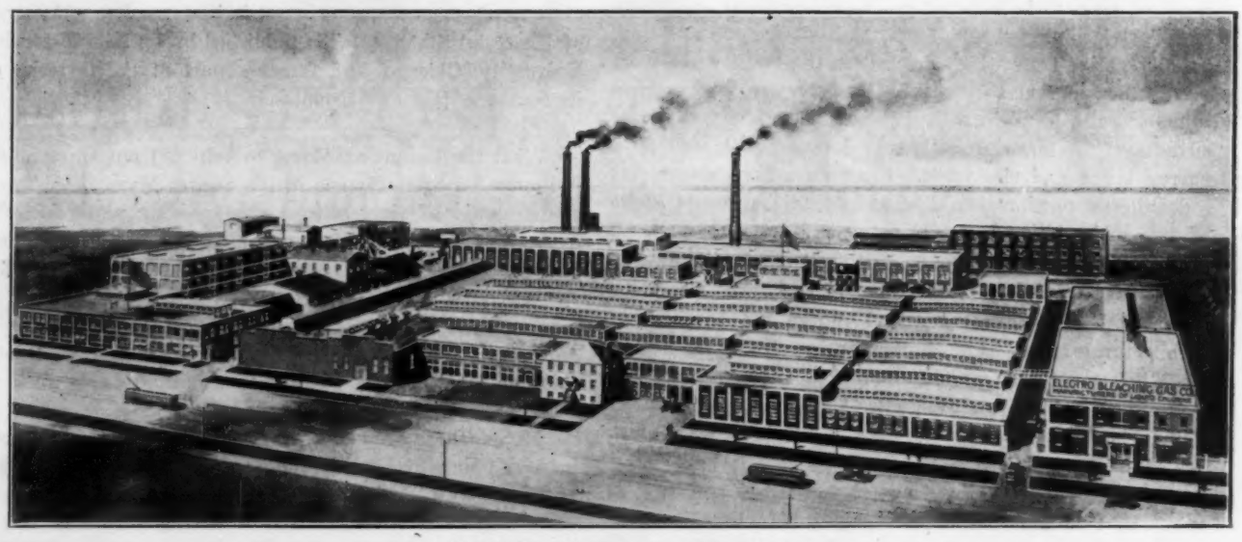
	Totals.		United States.		United Kingdom.		Germany.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
Mexico	$97,886,169	$150,202,808	$48,643,778	$116,017,854	$12,950,047	$15,573,522	$12,610,385	$8,219,009
Cuba	143,758,736	164,823,059	75,967,525	131,783,619	16,071,787	18,427,163	9,473,543	4,707,548
Dominican Republic	9,272,278	10,469,947	5,769,061	5,600,768	730,191	241,810	1,677,833	2,068,384
Haiti	8,100,125	11,315,559	5,908,956	[1] 1,000,000	593,319	[1] 800,000	535,544	[1] 4,200,000
Guatemala	10,062,328	14,449,926	5,053,060	3,923,354	1,650,387	1,600,029	2,043,329	7,653,557
Salvador	6,173,545	9,928,724	2,491,146	2,823,851	1,603,846	705,607	713,855	1,699,694
Honduras	5,132,678	3,300,254	3,457,074	2,869,188	712,750	13,467	558,327	176,112
Nicaragua	5,770,006	7,712,047	3,244,008	2,722,385	1,150,611	998,564	619,213	1,887,698
Costa Rica	8,778,497	10 432,553	4,515,871	5,297,146	1,303,187	4,364,436	1,355,417	509,804
Panama	11,397,000	5,383,027	6,378,702	4,801,608	2,465,431	65,024	1,078,167	216,939
Venezuela	18,030,103	29,483,789	6,944,136	8,475,581	4,296,294	2,207,738	2,586,986	5,563,768
Colombia	28,535,800	34,315,800	7,629,500	18,861,800	5,837,400	5,566,000	4,012,100	3,216,200
Ecuador	8,836,689	15,789,367	2,817,754	3,833,728	2,617,926	1,620,092	1,563,129	2,627,353
Peru	29,591,452	44,409,610	8,530,525	14,741,639	7,769,225	16,539,110	5,132,039	2,966,884
Brazil	326,428,509	315,164,687	51,289,682	102,562,923	79,881,008	41,701,815	57,043,754	44,392,410
Bolivia	21,357,505	36,551,390	1,577,200	218,195	4,329,659	29,548,087	7,835,632	3,109,758
Paraguay	7,876,397	5,462,001	473,678	.....	2,254,312	158	2,176,606	1,198,686
Uruguay	50,666,000	65,142,000	[1] 8,000,000	2,972,222	[1] 5,500,000	[1] 12,500,000	[1] 9,800,000	[1] 12,000,000
Chile	120,274,001	144,653,312	20,089,158	30,413,386	36,109,211	55,548,341	29,578,138	30,772,743
Argentina	408,711,966	468,999,410	60,171,867	22,207,965	126,959,989	116,756,777	69,172,279	56,178,368
Totals	1,326,689,784	1,547,989,270	328,952,681	481,127,162	314,786,580	324,777,740	219,566,276	193,364,915
Per cent of total	100	100	24.79	31.08	23.73	20.98	16.55	12.49

[1] Estimated.

Nearly $220,000,000 of trade that Germany had looks impressive, although much below the figures for the United States or for England. The point that the figures do not tell is that the German trade was precarious, somewhat artificial, and by no means well based. Its bases were long credits and cheap goods Long credits and cheapness are undoubtedly attractive baits with which to fish for trade, but not necessarily for the best kind of trade. Furthermore, long credits and cheapness are like boomerangs, having a return curve often to the hurt of the user. It was notorious that German losses in Latin America were much greater than British or American losses. Many well-informed persons believe them to be greater than both combined. The Germans had what amounted to an almost complete monopoly of the bad risks. On the contrary, American losses from bad credits were almost negligible. The leading New York house in the South American export field, through one of its officials, has stated that its losses in South America, extending over a long period, amounted to a very small fraction of 1 per cent.

No doubt Americans have been too conservative. The writer of this article has said so often, on the other hand, he does not believe that German methods in granting credits were either wise or that in the long run they made for increased business. But it was in the matter of cheap goods that German methods at their worst were seen. Germany treated Latin Americans as on a plane with Chinese and Central Africans. It was thought that anything might be sold if only cheap enough Price was everything; quality nothing. The result might have been foreseen. The flood of cheap, flimsy, and gaudy Brummagem wares that poured into Latin America underminded the German reputation. The German stamp on an article was a grave handicap even when the article itself was not bad. It may be said that there were a few, but very few (principally textile), manufactures of German origin which kept up the standard. Even the dishonest subterfuge of placing American and English labels on German goods did not save the situation. Just prior to the European War, German trade in most of Latin America was in such a parlous state as to be in danger of immediate dissolution. This was due to many causes, most of which are not mentioned here, but no other had greater weight in breaking down the German commercial structure in Latin America than this loss of reputation due to cheap and inefficient goods.

In 14 of the 20 Latin-American countries, notwithstanding the strenuous efforts made by Germany to acquire or to preserve the trade, the result had been practically failure. The imports from Germany in these countries was only slightly over 11 per cent of the whole and less than one-fourth of the imports from the United States.



THE HOME OF LIQUID CHLORINE.

Mill Village Planning.

(Continued from page 330.)

Although the landscape architect does not attempt to work out individual plans for houses, deeming such to be within the architect's province, yet the question of the general type of house to be used lies within the scope of his work. The mills have shown improvement in their progress from the early plain—we would call them today shacks—to the present varied type of mill village house. Mill owners should pay careful attention to the color combinations of the paints used on the houses. The number of different colors used in painting the mill village should be restricted so that no "rainbow" effect be produced, yet sufficient variety of color should be given to make development interesting. In this respect mill owners by controlling their developments have opportunities far in advance of the ordinary city or suburban section, where one is not usually responsible for the color of one's neighbor's house! There is a fault cropping up in some mill villages to seek too much variety of detail in houses, variation of posts, porches, windows, etc. To do this makes the houses fussy, and we must remember that the mill employees house is necessarily a comparatively low cost house, hence simplicity must be the keynote. Following the motto of less variation in small details and more in house location will give more permanent effects. Ornate and finiky details should not be allowed to creep into the houses—better the plain, well proportioned house. It is important to vary the proportions of the house occasionally, often by breaking the roof line; for example, a series of story and a half bungalows with a two-story house or group of houses at favorable or important locations.

Planting is the last detail to be taken up in carrying out the plan of the mill village and is important in giving the finishing touches to the development. Many of our present mill developments are at the point where their houses and streets are located, their developments decided on, and are ready for beautification. Possibly the most important planting—particularly if the village be open and sunny—is the location of street trees on the parking strips at distances of from twenty-five to fifty feet apart depending mostly on the type of tree. No definite advice as to the types of trees to be selected can be given; local conditions of soil and climate should form the basis for the selection. Usually native trees which do well in the locality are most satisfactory in that they require less care to give good results, and also blend in with the natural landscape to better advantage. A large growing tree does not look well on a narrow street and vice versa. From an artistic standpoint a definite proportion should be maintained between the size of tree and width of street.

Coincident with the planting of street trees, an effort to secure the planting of a few trees in each yard should be made, both to secure shade and relieve the bareness of architectural effect. For first planting trees are rather more important than shrubs, in that it requires longer to make their growth and the effects are more permanent. Try to establish permanent trees and avoid the soft, quick growing kinds.

Both trees and shrubs are used for screen planting, of value to hide undesirable or disagreeable views, such as are sometimes to be found, as views through the back yards. Wherever an objectionable feature is encountered, if possible get rid of it, otherwise screen it.

The smaller shrubs and trees are of particular value in softening the appearance of the houses and buildings; commonly called "Foundation Planting," and very attractive when well kept up. If you were to ask the one best planting material, I would say grass, and very fortunate are the sections where grass—particularly the native blue grass—grows to best advantage. However, the greater part of the South cannot raise grass to the best advantage and in these sections more reliance must be placed on shrubs and hedges to achieve the softened effect which planting gives. The general type of planting in mill villages should be quiet and simple in character. Avoid the coarse, showy flowering shrubs in that they are not of a restful nature. Privet, whether used as hedge or allowed to grow untrimmed, is the best all-around shrub for mill village use.

A Useful Booklet.

Another of their very practical pamphlets on business methods has just come from the press of LaSalle Extension University. It is called "Analysis of Financial Statements," and is the joint work of Richard P. Wilson and Harry J. Carpenter, both of the Credit Department of the National Bank of Commerce, New York.

The authors believe in teaching by example. Accordingly, they start at once with a typical statement of a wholesale grocery business. They examine each item and show its practical meaning, the tests to which it should be subjected, and its relation to other aspects of the business. Statements of a packing house, and a jobber, and a cotton-mill are then handled in a similar way. The advantages of this method are evident at once. The reader is taken straight through the analysis of four representative statements, and so is assured of getting every essential point. With this treatise in his hand, he is in no danger of being tricked by a misleading financial statement.

But the book has another and even more important use. Most men in business for themselves have to prepare statements occasionally in order to secure accommodation from the banks and for other purposes. A knowledge of the way in which their statements are scrutinized enables one to prepare them so as to get the best results. "Analysis of Financial Statements" is published by LaSalle Extension University, Chicago, and forms a part of the material of its course in Higher Accountancy.

What the Unions are doing to help (?) our Government is illustrated by an article in the Sunset Magazine. Twenty-five gangs of riveters in a ship-building plant formally averaged 400 rivets per gang per day. Since being unionized the average is 51 rivets per gang per day. The San Francisco Caulkers Union has a by-law providing that no worker shall caulk more than 150 feet of deck seam or more than 100 feet of side seam in eight hours. Double this amount should be caulked in a normal day's work.

Motor trucks are being used for delivery of freight from interior points by Long Island Sound steamers to westbound trains at New York City, eliminating the use of transfer cars, engines, and switching, and saving yard and freight house space.

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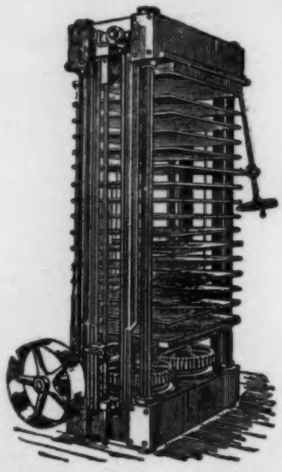

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Warp Loom Analysis

BY WILLIAM DAVIS, M. A.

One of the best known forms of warp looms driven by power is known under the name of the "Fast Warp Loom" and in general principles is built similar to the original hand machine. The sinkers, needles and thread guides are all in simlar positions but their motion is obtined from cams placed on a central shaft. The general features of the mechanism are given in Figure *A* where the presser is marked *PR*, the sinker *S*, the needle *N*, the needle-bar *NB*, the warp thread guide points are marked *P*, and P_1; *L* is a dividing lever; the approximate position of the main shaft is indicated in the direction of letters *MS*, two warps are indicated in the sketch *W* and W_1 and these are proceeding from the warp beams *WB* and WB_1.

Regarding the the movement of the various parts, the needle bar *NB* is stationary but the sinkers *S* require a combination of a vertical and out and in motion to form the course of loops, both kinds of motion being obtained

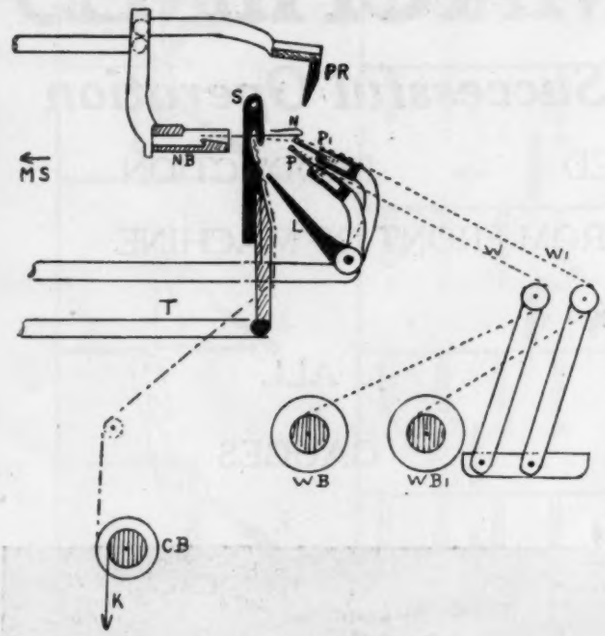

FIG. A.

from cams which rotate on the main shaft, *MS*. The presser *PR* is brought down onto the needle springs by a cam working on the main shaft, the cam being at the left end of a lever and the presser at the right hand end. The winding up of the cloth *C* onto the cloth beam *CB* takes place in negative fashion through the agency of the weight *K*. When a course or so of fabric has been worked the cloth becomes slacker and enables the weight to pull round the cloth beam by a corresponding amount. One of the levers operating the sinker bar is shown at *T* in the form of a lever, the left end of which works on a cam on the main shaft *MS* by means of a friction roller. The dividing lever *L* serves the function of keeping the warp threads separate from the finished loops and is necessary to a clean formation of the loops of a new course.

This machine is made to work with great precision and several guide bars added enabled the scope and diversity of production to be very greatly extended. A few observations will show its defects from a mechanical point of view. The worker stands on the right of the machine as shown in the sketch when it will be seen that the mechanism is very inaccessible. Near the same space there are the guide bars, the warp yarns, the warp beams and also the cloth beam. These are all close together and obscure a view of the fabric during working so that the detecting of faults is rendered very difficult. In the more recent looms a great advance in simplicity of construction has been made by putting all the warp beams straight above the machine. The warps proceed downward and pass through the eyes of the guides which are also arranged in a vertical direction. This clears the front of the frame completely and a full view of the fabric can be secured as it is being worked.

STAGES OF LOOP FORMATION.

The various steps in forming a course of loops on the power loom are illustrated in Figure *B*, where the different stages are marked 1 to 6, exactly as they follow each other in one complete operation. In stage 1 the various parts correspond with Figure A where the sinker is marked *S*, the needle *N*, the finished cloth or fabric *C*, the thread of warp is *W*, the point of the guide bar is marked *P* and the action proceeds as follows: (1) The warp threads *W* are raised into the dotted position above the needles by the upward sweep of the point *P* and the guide bar. (2) The point with the yarn is here seen to have descended after having made a side-wise move to the left the space of one needle. It should be carefully noted that this action has caused the thread to be laid directly in front of the nose of sinker *S*, a matter which is of primary importance in the operation of pressing shown in stage (3). The sinker *S* is here seen to have moved towards the right and having the thread of warp across its nose, it pushes the thread under the beard or spring of the needle, at which instant the cam on the main shaft brings down the presser *PR*. This presses firmly against the beards or springs and forces them into the grooves of the needles. In stage (4) the sinker is noticed to have made a further movement towards the right and pushes the old stitch onto the beard, an action which must be complete before the presser relinquishes its pressure on the beard. In stage (5) the presser has again moved upwards out of contact with the needle spring and the sinker has risen and with a forward movement to the right contrives to throw the old stitch over the end of the needle. In so doing the spring still holding the new yarn is enabled to draw this piece of thread through the former or "old" loop, thus making a further course of loops. In stage (6) the guide bar with its point *P* is shown in its normal position, and the sinker has again risen and receded to its normal position on the left, taking the newly-formed loops well back under their throats.

A study of these different stages of loop formation in the warp loom will enable the reader to understand the system of build which is common to all types of warp loom products and a clear understanding of the movements necessary to form a row of loops should enable the operator to detect quickly a number of defects in the mechanism or in the fabric.

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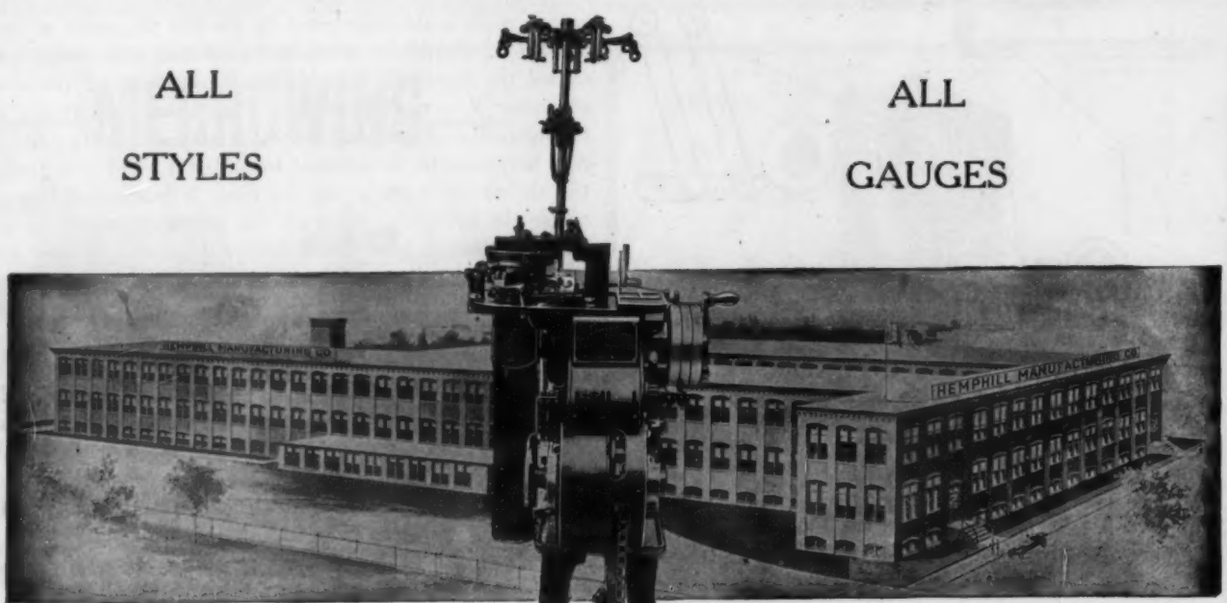

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STAGES OF THE LAPPING.

The precise motion of the thread in lapping over the needle may be made clear by referring to a similar set of figures marked 7 to 14, Fig. C, which represent a frontal view of the stitch-forming parts. This enables us

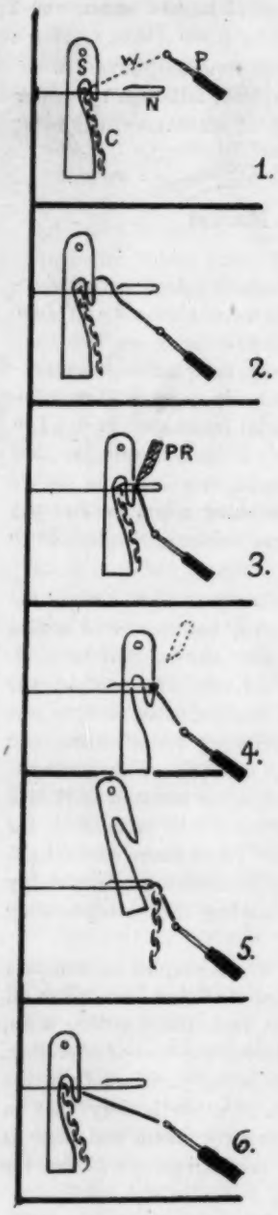

FIG. B.

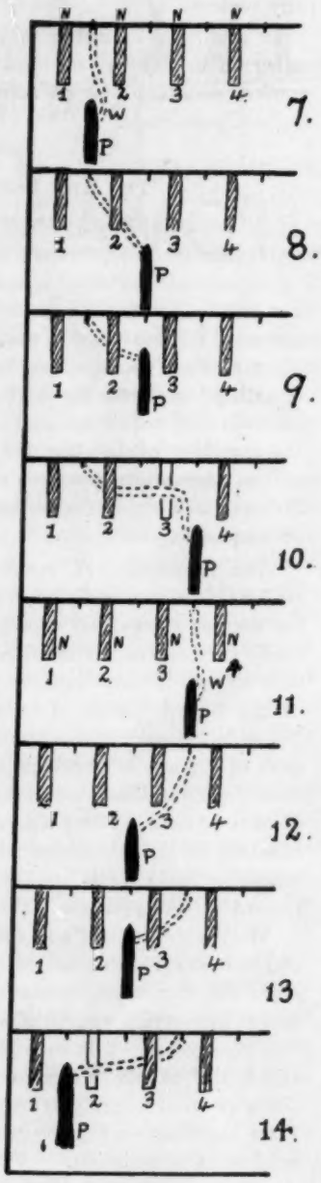

FIG. C.

to trace the different stages in the sidewise movement of the warp thread in the important action of laying its yarn over the stem of the needle and in front of the sinker nose. The vertical lines in these diagrams represents the needles *N* and marked 1 to 4 from left to right. The warp yarn is indicated by *W* and the guide bar point by *P* as before.

In the first half of the diagram are shown the successive motions of one warp thread and its guide point in laying the yarn over the stem of the needle preparatory to knitting being performed. Stage (7) shows the point *P* to the right of needle 1 with the thread *W* coming straight from the fabric, this being the normal position before the operation of lapping is commenced. Stage (8) indicates that the guide point *P* has moved one needle space to the right and now stands between needles 2 and 3, having its thread under needle 2. In stage (9) the guide point rises between needles 2 and 3. In stage (10) the guide point has moved a further needle space to the right and by dropping between needles 3 and 4 succeeds in laying its yarn over the stem of the needle and incidentally across the nose of the sinker. The course is now completed as has been just described in Figure B.

This sidewise motion to the right may continue exactly as stated for several courses farther, but it is certain that after a few courses a return will need to made to the point from which we started and this process is indicated in stages (11) to (14) in the second half of the diagram. Let us suppose that the thread laid in examples (7) to (10) does not proceed farther to the right but, as in the simplest form of warp loom fabric, is required to return at once to the starting point, then in stage (11) we have the guide point between needles 3 and 4 just after the loop has been completed. In stage (12) the guide point makes its first movement to the left carrying its thread under needle 3. In stage (13) the guide point rises between needles 2 and 3 and in stage (14) the guide point has made a farther movement over one needle space to the left and in dropping lays its thread over needle 2 when the formation of a course of loops can again be proceeded with as shown in detail in Fig. B.

When thus described in detail, it would appear that the making of fabrics on this loom is very complicated but many of the difficulties are more apparent than real, for once the system of lapping has been understood, the operator is able to extend his knowledge to the analysis of the great diversity of fabrics which can be made on this machine. In Fig. A it will be noted that two warps and two guide bars are exhibited and each of the warps can be worked independent of the other. One guide bar and one warp is usually retained for the ground but in addition we may introduce several guide bars each having their own separate warp threads drawn through them and each of which can be made to fulfill a distinct function in the fabric.

Pennsylvania Knit Goods Men Meet.

In line with the movement in some commercial lines for eliminating discounts, the Pennsylvania knit goods manufacturers at their February meeting, in Reading, adopted a resolution requesting the National Association of Hosiery and Underwear Manufacturers to take a referendum of the members on the question of selling on the basis of 10 days net. Several of the mills represented at the meeting already are selling on that basis exclusively and are having a market for all that it is possible for the mills to produce, besides rejecting the least desirable orders.

The meeting drove another nail in the coffin of freight and cartage allowance, after a discussion during which it developed that some of the Pennsylvania manufacturers had not fallen in line with the rational shipping plan, as adopted by an almost unanimous vote of the Association several months ago.

It was stated by a member in close touch with the underwear manufacturers of New York State that practically all are shipping f.o.b. forwarding point and making no allowance whatever for freight or cartage. A similar report

came from the South, where, it was reported by persons in a position to speak authoritively, knit goods manufacturers generally have abandoned the practice of making these allowances. Two large southern mills it was announced, which until recently made an allowance of fifty cents freight on New York deliveries, have notified customers that f.o.b. mill will apply to all new business, and that carrying and cartage charges will have to be borne by the consignees.

These reports of the reform in shipping having been safely anchored in the South and in the New York underwear section, and the experiences of many of those present who for some time had been pursuing the more business-like method of delivery, would in themselves have been sufficient to bring affirmative action, but when it was made plain that two southern associations of cotton yarn spinners had decided to no longer prepay or allow deductions for freight there was an instant demand that knit goods manufacturers adopt the policy. Under a resolution for a show of hands, the hand of all of the thirty and more present was raised in a pledge that hereafter their mills would ship only f.o.b. mill point and that consignees pay all charges from the time the merchandise is placed on board cars. It was regarded as a foregone conclusion that mills shipping in any other way will be few and far between—so few that buyers will suspect that they are in urgent need of business and will be disposed to treat them accordingly.

On the question of discontinuing cash discounts there was a diversity of opinion, some of the manufacturers holding that, while the discount simply was "something that was added to be taken off," was much abused and gave rise to no end of controversies, its sudden discontinuance might be viewed as tending to disturb the office system of many large houses and would be antagonized by large distributors who adhere closely to sales terms and make no attempt to appropriate discounts when not entitled to them. It was the more numerous class of merchants, those who buy subject to discount and remit when convenient, arbitrarily taking the premium for a service not rendered, that the advocates of net selling were after. The resolution for a referendum on the subject was adopted by an almost unanimous vote.

A Philadelphia manufacturer speaking on the coal shortage, stated that last year he made a contract for 2000 tons of bituminous coal, to be delivered in monthly shipments. The price figured in the contract was $5.50 a ton. When he received his invoice for January deliveries he was amazed to find that the shipper had jumped the price $1.50 a ton. The manufacturer protested in vain, and paid $7 instead of $5.50. The incident was introduced as showing the contingencies that are liable to arise, making it necessary, in selling mill production for months ahead, to provide in the selling figure sufficient margin to cover such unlooked for increases between the time of sale and manufacture.

As further showing the difficulties under which manufacturers labor as a result of muddled shipping conditions, a mill working on a government contract for half hose and which was to have delivered 100,000 pairs in January, was unable to deliver a dozen, and during the month did not get a pound of yarn.

Another manufacturer is yet to receive yarn which was to have been and may have been shipped in October. While most of the delays were charged to railroad conditions, there were several reports of delinquency on the part of Northern yarn merchants.

Several manufacturers on government work said they experienced more difficulty in getting delivery since the government took over the railroads. When the companies were in control, they said, it was possible to get priority. Now the government authorities say simply that they are doing the best they can, and their best is far from as satisfactory as was the best that could be had under company control.

In a number of instances, it was reported, buyers were called on to pay for supplies invoiced, although the seller frankly admitted that on account of embargoes, shipment had not been made.

The Knit Goods Market.

Having muddled through the idle-Mondays period during which industry was halted to meet a scarcity of fuel due to the blunder of establishing a price so low that operators felt conpelled to shut down their mines, manufacturers of knit goods should now be in position for compensating themselves for the financial losses sustained. The inconvenience which was suffered will be forgotten, so that the sacrifices of the last few weeks may later be viewed as less momentous than was anticipated when, on January 17th the memorable fuel order was suddenly clapped down on commerce.

The production of hosiery that was lost during the six idle days, never to be recovered, has served to stiffen the market beyond all expectations. Cotton half-hose, already very scarce for immediate delivery when output was shut off, are in more pronounced shortage than ever, as one of the logical results of suspension of manufacture, and prices necessary are continuing upward. For example, sales of 176 needle looped toe, carded, are common at $1.50 a dozen, and at least one manufacturer who is holding for $1.60 is reported getting his price. Finer gauge cotton half-hose are in the procession with 176 needle goods, steadily mounting, while 144's are about holding their own, tending toward slight advances.

Only a few weeks ago there was a surplus of women's cotton hosiery. Much of the excess stock has been taken off since the day when conservation took the startling turn, and as production was curtailed during the days of muddling, this class of goods is in a much better position, from the standpoint of the manuafcturer. Cotton hosiery that in January went begging is being eagerly taken, and there is little haggling over price when meritorious goods are the subject of negotiation.

While men's socks are the star performer among the scarce things in hosiery, there is a very acute shortage of misses hose in both fine and coarse gauge. The latter are reported selling in spots at $1.85, which is about $1.25 above the normal price. Fine gauge have moved up in the last six weeks from $2.10 to $2.25, and sales were made late in February at $2.30.

Considerable interest is shown in combed peeler half hose, variously quoted at $1.85 to $2.15, the variation covering count of yarn and weight. A well finished 200 to 220 needle sock, from 18's combed peeler, is rated by mill agents worth $2.25, the price at which the well-known brand of a southern mill is selling. Single soles command about 20 cents less.

Until recently a few jobbers were offering goods under

mill prices. Some are reported still doing so, but they have moved their prices up.

A commission house shows a letter of early February date from a jobbing house in Chicago offering 176 needle full seamless half hose, about one pound, in bundles, 200 dozens to the case, at $1.31, f.o.b. Chicago. The same commission house has a quotation from a mill of $1.35 for the same type of socks, sewed toe, in boxes. While the Chicago jobber is reported rated at $50,000, it is significant that its letter heads are type-written, instead of being printed.

What appear to be offers of ridiculously low prices sometimes are mentioned in good faith, but in error. For illustration, Porter Brothers & Co., New York, submitted to the Rocky Mount, N. C., Hosiery Company a Southern mill's illustrated folder quoting a line of misses' ribs at "$1.35 to jobbers, to be sold retail at 15 cents." In the same week that the Rocky Mount received the folder the executive of the mill was offered $1.65 for the same grade of ribs. The folder doubtless was of an issue of some months before and doubtless was used innocently for price comparison purposes. The incident is one of many that may be cited for showing that when low prices are mentioned they should be given no consideration until after thorough investigation.

Although March 1 was informally designated by Southern manufacturers for opening cotton hosiery lines for fall, it need not be surprising if mills decline to name prices until two to four weeks later. It is a question whether it were wise to open before jobbers actually must have prices and samples. Even at that, why should prices be named for May, June and July, so long as all-year-'round hosiery can be sold from month to month? Government authorities having conceded a higher wage to shipyard employees, it is regarded a foregone conclusion that mill help will have to be given a boost or two to avert strikes.

Looking into the future, yarns are little less uncertain as commodity than is labor. Then there remains the fear of further "Bureau" disturbance. The fuel order may have been but a forerunner of necessary but calamitous measures. At this writing there is considerable speculation as to the ultimate effect of President Wilson's proclamation of February 15 placing all foreign trade under license of the War Trade Board. So far as any embargo on imports is concerned, it will not affect knit goods, for the reason that practically no knitted material is coming in. Exports may be hard hit. The United States has been enjoying a large trade in hosiery and underwear in South American and Scandinavian countries. How much of this is to be lost under the licensing system for a 50 per cent curtailment in foreign trade is a matter of conjecture.

Selling three or six months ahead, under existing conditions, might make a weak mill or break a strong one. Business thus placed and accepted will be as safe—and no safer—than toying with the stock market. Fortunately the trend is toward conservatism and protection of credit, with manufacturer and merchant. Credit men at both ends of the transaction are watching affairs, which accounts in part for an apparently lazy market since the middle of January.

There have been two well defined reasons for sluggish movement in knit goods. Under the policy of restricted buying, distributors took sparingly of the lines that were in good supply. Of other lines there was a dearth, and, besides, freight congestion made shipping out uncertain and costly. By the time this is printed, the spring drive should be on. Buyers are in the Eastern market from distant points, mostly "shopping around."

Restricted buying may be attributed to the difficulty which merchants would experience in financing their business were they to operate on the basis of last year as measured in dozens. It is here that the credit departments are playing a part.

A distant retailer who buys from mill direct reduced a $20,000 underwear order to $6500. It was explained by the executive of the house that had its buyers in its several departments taken as heavily as had the underwear buyer the house would have faced bankruptcy. Men's suits that formerly cost the store $10 to $12.50 are coming in at $25 and must go to the wearer at $35 to $37.50. The cloth in these suits weighs 11 ounces to the yard as against 14 to 16 formerly. The merchant feels quite certain that he cannot sell as many suits at the higher price as he sold last year. A yard-wide sheeting is costing the store more than 200 per cent above the price of 1914. A popular brand of gingham that in 1915 was sold to retailers at 8 to 8½ cents is costing jobbers 18 to 18½. Taking these few lines for illustration, it is obvious that merchants, whose drawing accounts at their banks cannot be increased in proportion with the higher costs of doing business, must buy cautiously if they are interested in maintaining their credit unimpaired.

On the other hand, many large mills are unwilling to grant credit commensurate with the requirements of customers. The road salesmen of a mill whose lines are handled by 80,000 retailers call on 26,000 of these merchants. The average capital of all of these latter dealers is from $5000 to $7000. Necessarily they are not in position to buy as many dozens as a year ago, and their initial orders for Fall are light. The mill has confidence in the buying power of the American public and feels justified in operating to capacity for accumulating stock, from which its customers later may fill in for their wants, but at prices higher than those at which they are buying to-day. New Government business may go far toward maintaining values. This business is estimated at from $50,000,000 to $60,000,000.

An eastern mill selling to the retail trade is having its customers place advance orders at to-day's prices. They are allowed deliveries of say 50 per cent of their requirements, future shipments to be made as their accounts for merchandise received are settled.

The real famine in knit goods is in wool hosiery, with underwear of cotton-wool mixture promising to be a close second before deliveries for Fall can be completed. And, although much is heard about retailers being well stocked up for summer, spring shipments threaten to be very disappointing.

Knit goods factors who have made a survey of supplies and prospective production, estimate that in some lines it will be a physical impossibility for mills to deliver more than 70 per cent of what was sold for January, February and March. In underwear this applies more particularly to women's pants, vests and union suits, and that some jobbers have taken note of the presumption of a scarcity is evidenced in a willingness to take almost anything in firsts and seconds for spot. In one instance a jobber, who has ladies' unions on order at $2.70, took 10 cases at $3.10 for immediate delivery.

The gradual tightening in wool hosiery is working toward a demand for cashmerette goods, it being assumed that if the wool-loving public cannot get wool it will be satis-

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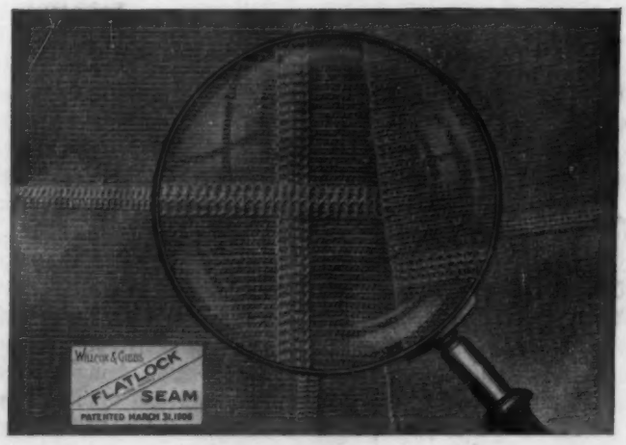

THE elimination of some operations hitherto found necessary in the manufacture of knit underwear means lower operating cost and quicker production, and for this reason many prominent knit underwear manufacturers have adopted the *Flatlock* Machine for seaming.

The Flatlock Machine makes the strongest, most durable, most sightly seam that can be used to seam knit underwear. The Flatlock Seam comes from the machine *complete*, saving the cost and delay of the additional covering operation heretofore deemed necessary.

Can *you* afford to neglect the operating economy which Flatlock equipment offers you, and the sales promoting value of the Flatlock Seam in selling your goods?

"The United States Government Specifications for Army and Navy underwear provide as follows:

"All seams to be flat and double seamed except where FLATLOCK seam is used" . . . .
"All stitching to be secure and strong, and not to ravel or pull out."

AND THAT

"The FLATLOCK Seam may be used without a covering seam"

The FLATLOCK Seam is absolutely flat---a perfect union of abutted cut edges.

Any number of stitches in the Flatlock seam may be cut, but the seam itself *will not rip nor ravel when pulled in either direction.*

Write us for list of nearly one hundred Underwear Mills already using Flatlock Machines.

Trade Mark

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fied with something that has the effect of a wool finish.

Very few jobbers had wool socks of any moment in their bins at the beginning of distribution for the present retail season, and will have less this year. Deliveries will be in such small quantity, it is predicted, that the average retail dealer will not get enough dozens to cover the usual line of assortments. One mill which ordinarily begins operation on wool hosiery on January 1 for the current year still has 8,000,000 pairs to make for the army. What wool socks reach the civilian trade for next Fall will have to retail at 75 cents on the basis of 3-pound 84 needle goods bundled, as against 25 cents formerly.

While heavy-weight cotton underwear in the main is sold well up, it is known that many merchants still have much to buy for their usual requirements. Woolen underwear has enjoyed a bit of sporadic popularity that is being made a pretext for going slowly in cottons. Local demand was increased by the excessively cold winter and many heatless days in homes, stores and office buildings, and many who hitherto wore cottons exclusively took to woolens and mixtures, for greater comfort indoors as well as outdoors.

Undoubtedly a factor in the growing popularity of wool underwear is the fact that it is required by the government. The public knows that the men in the military service are required to wear wool underwear and hosiery, and much of the public has come to feel that it too should wear wool. No more effective publicity ever was given to the merits of the animal fibre than the government specifications calling for a large percentum of wool, and observers believe that the use of this type of garments has been so stimulated that for years to come the trend toward wool will increase.

It is a question whether the same influences that are operating in favor of wool underwear will not have some bearing on men's heavy union suits. Some persons, it has developed, are willing to believe that because the Government buys shirts and drawers exclusively there must be special merit in the two-piece garment, and are disposed to banish the union from their wardrobe. In some measure the public seems to subscribe to the doctrine that what is not good for the soldier is not good for the civilian.

It is being taken into consideration, too, that every previous wearer of a union suit who has gone into the military service now is clad in shirts and drawers, a fact which may not be without its adverse effect on mills making heavy unions exclusively. Yet there is reported no abundance of this type of garments, and it is felt that the eventual shortage of separate garments will operate to force a demand for all of the unions that can be supplied as distributors come to fill in for fall.

Some distributors say there is percepible decline in the use of women's light weight underwear. The envelope chemise and the use of glove cloth, it is stated, is having a marked effect on the demand for women's knitted underwear for summer. It is the impression, however, that this is going to cut more deeply into nainsooks than the knitted garments.

Neither the fads of women nor the fancies of men will operate to prevent a scarcity of civilian hosiery and underwear for 1918. It is understood there are to be heavy purchases for new government requirements. Aside from this, diminished production is readily accounted for.

Not a few mills have been shut down for two weeks and more, due to lack of fuel and inability to get deliveries of yarns embargoed or tied up in the freight congestion.

Desertions of help from mills have been in greater numbers since the inauguration of Monday shut-downs, employees leaving in scores to take employment in munition plants where the closing order has not been effective.

At this range it would appear that the consumer will have to pay heavily for the conservatism of mill and merchant, for deferred purchase will be at higher prices, and, as always, the increase will be passed along to the ultimate buyer.

Among the Knitting Mills.

The Mitchell Hosiery Company, of Columbus, Ga., is one of the comparatively new hosiery manufacturing organizations of that state. They have an excellent mill property which was formerly a sugar mill before it was converted into a hosiery factory. It is of brick, mill constructed, and is thoroughly equipped for the excellent grade of hose and half hose, both bleached and dyed which are

LEFT TO RIGHT: SECRETARY AND TREASURER JOHN A. MITCHELL, JR., AND SUPERINTENDENT E. C. KENNEDY OF THE MITCHELL HOSIERY COMPANY, COLUMBUS, GA.

being manufactured by the Mitchell Hosiery Company. The knitting machinery and loopers are all located on the second floor, Banner machines being used. The offices and finishing rooms are commodious as are the dyeing, bleaching and finishing sections. John A. Mitchell, formerly connected with the Hamburger Cotton Mills at Columbus, is the President of this company and his son, John A. Mitchell, Jr., is Secretary and Treasurer. E. C. Kennedy, the Superintendent is a man of wide experience in the hosiery field and was for many years connected with mills in Utica, New York, New York City and other sections.

Final details have been determined for the Anderson (S. C.) Hosiery Mills, announced recently. The initial daily capacity will be 240 dozen pairs of half-hose, and the building to be erected will have floor space for the installation of machinery to increase this daily output to 1000 dozen. Plans and specifications are being furnished by C. Gadsden Sayre, architect, who is also vice-president and secretary of the company, for a two-story 84x50-foot mill-construction building costing $10,000. Twenty knitting machines, electric motors, etc., costing $15,000 have been

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Characteristics

The characteristics of a knitting machine, like those of an individual, are determined by its origin and history; just as knowledge of the individual's family, schooling, and early life are desirable for the formation of an idea of his characteristics, so knowledge of the plant, personnel and ideals involved in the construction of the knitting machine are necessary for an understanding of its merits. Investigate the origin of our knitting machinery.

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ordered, and bleaching, dyeing and finishing equipment will be purchased.

Twenty new knitting machines will be added by the National Knitting Mills of New Orleans and this equipment has been ordered.

The Gaston Knitting Mill at Cherryville, N. C., has just begun operations and is turning out men's hosiery. The promoters have made arrangements to install additional machinery.

At a private sale the plant of the Paducah Hosiery Mills was purchased by L. F. Kolb, H. F. Kolb and E. O. Davis for $27,000. The sale was the result of litigation, causing the removal of E. O. Davis as manager and placing the plant in the hands of a receiver. A strike of 100 employees following. Mr. Davis will be manager for the new owners and he has announced the capacity would be doubled within the next few weeks. A large building nearby has been leased and will be equipped with machinery.

Knit underwear will be the product of the High Point (N. C.) Underwear Co., which has been incorporated with $125,000 capital. C. D. Smith, R. B. Terry and T. V. Rochell are the incorporators.

Plans have been decided upon for a big addition to the North State Knitting Mills of Durham, N. C., and the capitalization has been increased from $25,000 to $150,000. The company will build an additional plant and equip it with machinery, increasing the present daily capacity to 2500 pairs of hose. Its new building will have three times the floor space of the present structure, which is equipped with 85 knitting machines. T. K. Poe is the contractor for the new building.

Plans are being prepared for a 140x100-foot mill construction building for the Chickasaw Hosiery Mills of Oklahoma City, and bids will be opened on February 1. W. H. Sears of Chattanooga, Tenn., is the architect, and the building will cost about $25,000. On March 1 bids will be opened for the equipment of machinery, to include 80 knitters, electric power drive, dyeing equipment, etc., to cost $20,000, for a daily capacity of 350 dozen pairs of women's cotton and lisle hose. From 50 to 75 operatives will be employed. The Chickasaw Hosiery Mills is a new company organized with $200,000 capital and the following officers: C. C. Campbell, president; A. W. Thornley, vice-president; T. E. Cullen secretary-treasurer.

J. M. Farrell, Blackville, S. C., has completed all arrangements for his Sunlight Hosiery Mills, to have an initial daily capacity of 400 dozen pairs of half-hose, and to be increased in units of 400 dozen. A 134x70-foot mill building and a 59x40-foot dyehouse, two stories, of brick and concrete, will be erected at a cost of $30,000. The machinery will include 60 knitters, with electric-power drive, costing $50,000.

The Wilson (N. C.) Knitting Mill has been incorporated and acquires the Runnymede Mill No. 3, increasing the capitalization from $50,000 to $150,000.

Two new branches for the manufacture of misses' fine gauged mercerized hosiery have been started up by the Richmond Hosiery Mills of Rossville, Ga. One of these is at Graysville, Tenn., the other at Charleston, Tenn. At the former there is an equipment of 100 knitting machines, and 75 operatives are employed under the management of Emmett Lane. At the Charleston plant 50 knitting machines have been installed and J. G. Sledge is the superintendent. Fifty operatives are employed. Buying of supplies for both of these branches is taken care of at the main office by Garnett Andrews, president of the company.

The Lookout Knitting Mills, Chattanooga, Tenn., will increase the capitalization from $50,000 to $100,000 and it is understood that the company is planning additions to its facilities.

Half-hose will be manufactured by the Wingo Manufacturing Co. of Forest City, N. C. This company is building a 60x40-foot mill, and the equipment of machinery will include knitting machines with electric power drive. It has organized with these officers: J. F. Alexander, president; K. S. Tanner, vice-president; W. P. Leister, secretary-treasurer.

The Honeycutt Knitting Co. of Charlotte, N. C., has been incorporated with an initial capital stock of $25,000, and the following incorporators: J. T. Dwyer, J. E. Honeycutt and W. S. Dorr, all of Charlotte.

Fire, on January 31, partially destroyed the plant of the Downs Manufacturing Company, 2706 North Palethorpe Street, Philadelphia, Pa., manufacturer of turkish towels, etc. The total loss is estimated at $50,000.

The H. C. Aberle Company, Philadelphia, Pa., has recently filed articles of incorporation with a capital of $10,000 to operate a plant for the manufacture of hosiery. Gustav C. Aberle is the principal incorporator.

The E. Ellsworth Livingston Company, Albany, N. Y., has been incorporated with a capital of $10,000 to manufacture hosiery, underwear, and knit goods. E. E. and M. Livingston, and C. R. Watson, Albany, are the incorporators.

The M. P. Tuttle Company, New York, has been incorporated with a capital of $175,000 to engage in the manufacture of cotton cloth. M. P. and C. C. Tuttle, and M. B. Berking, 22 West Ninth Street, New York, are the incorporators.

J. Alfred Thackrah, formerly connected with the Notaseme Hosiery Company, Philadelphia, has been made supply sergeant of his company in the 103d Regiment of Engineers at Camp Hancock, Ga.

The Berkshire Mills, 42 East Twentieth Street, New York, converters of cotton, have filed notice with the Public Service Commission of an increase in their capital from $10,000 to $152,000, to provide for expansion.

The United States Government has leased property consisting of about three city blocks bounded by Second and Third Avenues, Twenty-ninth and Thirty-second Streets, Brooklyn, N. Y., from the Bush Terminal Company, and is planning for the erection of large factory buildings and warehouses, one of which, it is said, will be used for the manufacture of service clothing. The structure will be eight-story, "U" shaped, about 200 x 700 feet, having two wings 75 feet in width.

An increase of capital from $25,000 to $100,000 has been announced by the Ashe Hosiery Mills of Knoxville, Tenn. This company plans an increase of daily production from 600 to 1000 dozen pairs of hose by the installation of additional new machinery.

The Claremont (N. C.) Hosiery Mills, recently organized, have 70 machines on men's and infants' hosiery. The officers of the company are: President, H. L. Arndt; secretary and treasurer, John Yount; superintendent, S. E. Cline; manager, C. S. Grove, Hickory, N. C.

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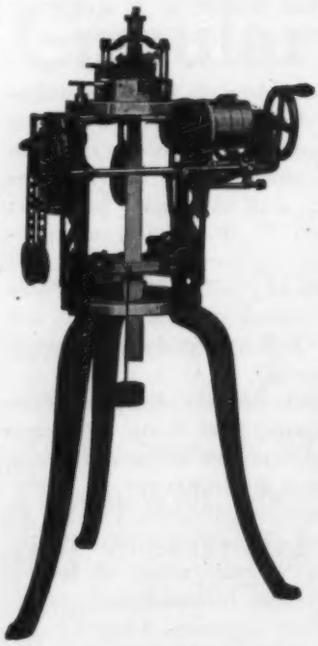

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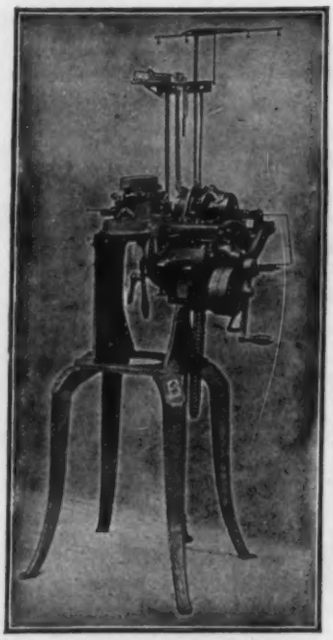

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America's Melting Pot.

There is a humorous situation in the dye industry, because dye chemistry over the world runs through German lines and German names. Even the National Aniline & Chemical Co., which consolidated several leading American dye concerns and started business July 1st has enough German names in its board of directors to make an Ally open wide his eyes. But Eugene Meyer, Jr., now giving his whole time to the Government at Washington, and J. F. Schoellkopf, one of the leading leather men of Buffalo, who is president of the National Aniline & Chemical Co., can not be accused of any pro-German sentiment. Nor can directors William H. Nichols, chairman of the war chemical industries, and Charles J. Thurnauer, working with the French commission at New Orleans.

Indeed, this concern probably shows a maximum of German names and a maximum of American patriotism. This board of directors is an excellent example of the mistake of judging patriotism in the melting pot of Uncle Sam by inherited names.

One of the most unfortunate things in this country is the anti-German sentiment sometimes aroused at the mention of a German name, and yet that German name may stand for more American patriotism than Brown, Jones, Smith or Robertson.

The du Ponts have been in the powder business for a hundred years, and if anything helped the Allies in the beginning of the war, it was the du Pont powder; yet some people will point to the du Ponts and say that the head of their rapidly oncoming dye industry was the former representative in this country of the German dye interests.

Allegations of German control in the dye industry have reached such a point that the National Aniline & Chemical Co. directors have given printed notice that they will hold responsible for damages any person giving currency to rumors of German control concerning this company.

The Kaiser is rapidly finding out that the best, the most patriotic and the most honest German brains emigrated years ago, and what astonishes the Teuton of Mitteleuropa is the transmuted German blood that is now wholly American and fighting on the side of the Allies.

Before 1914, Germany sent into the United States $10,000,000 in dyestuffs, an insignificant amount and not worth competition from America. It was better to buy dyes in Germany and teas in China than to attempt their production when there were so many things calling for development in this country that paid better.

When the war began, that ten million of dyestuffs became instantly worth one hundred million because of its relation to the whole fabric structure both in munitions and textiles. The United States quickly protected the building up of an American dye industry by protection.

The base of the industry was already in this country in the Benzol Products Co., which had a plant, experience and a deficit. This concern was started by the Solvay Process Co., which could furnish the benzol, the Barrett Manufacturing Co., which could furnish the naphthalene, and the General Chemical Co., which could furnish the acids. The Benzol Products Co. could therefore make the aniline oil at its little plant at Frankford, Pa., where it made aniline oil at a loss for ten years. The Germans steadily fought it. When a duty of one and one-half cents per pound was put on aniline oil, the Germans reduced their price just one and one-half cents. Nevertheless, at the opening of the war, W. J. Matheson of the General Chemical Co. and now chairman of the National Aniline & Chemical Co., induced the owners to put in another half million dollars and move the plant to Marcus Hook, near Wilmington, Del. The result was the salvation of the dye industry to the United States, for it gave a supply of aniline oil to the ordinary producer of dyestuffs and to the textile industry.

Today the Marcus Hook plant is the largest producer of aniline oil in the world, and it is the basis of the aniline industry for this continent. That industry at today's prices stands not for ten million dollars, but for at least one hundred millions.

Where it will stand after the war will depend not only upon American enterprise, but upon legislation protecting the industry here and in the foreign field into which it may be extended from its American base.—*Wall Street Journal.*

On the Needle Shortage.

A somewhat illuminating discussion of the needle situation, into which several manufacturers of machinery, knit goods and needles were drawn, was precipitated some days ago by a semi-authoritative statement which had gone out to the effect that there are being manufactured in the United States approximately 400,000 latch needles per day. In this connection it was estimated that prior to the outbreak of the European war the domestic production was about 200,000 a day and that 100,000 per day were being imported.

A representative of important needle interests deduced from the statement as it appeared that there should be no shortage of needles if the supplies were properly distributed. Contending that before the war the consumption of needles did not exceed the available supply, estimated at 300,000 per day—domestic and imported—and possibly averaging considerably less, he said:

"If now we take your estimates of production at the present time on a 300 day year the total production will be 20,000,000, and the knitting mills in order to be using all of these needles must have increased the consumption at least one-third, leaving out an additional consumption of present importations from Japan. We doubt if such increase has taken place.

"As a matter of fact, we think your estimates of the present production of needle makers are somewhat large, but we believe the present importations and the present domestic production would not be very far from what you estimate to be the present domestic production

"Hence it would seem that the present supply of latch needles, if properly distributed, would at least generously meet the needs of the domestic mills, and it would not seem that there would be any scarcity of these needles from the standpoint of insufficient production. If the situation is anywhere near what I have described it, there should be no possible chance for any domestic mills being short of latch needles for making knitted goods for government purposes."

In seeking an answer to the question whether needle production has kept pace with increased use of latch needles, the person quoted above seems to have left out of considera-

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tion several important factors, and he has overlooked the tremendous expansion in machine building. Seven years ago, it is recalled, one machine manufacturing company exploited in its advertising matter the fact that 10,000 of its machines were in use. A company not then in existence announces over its name that 35,000 of its machines are being used, and another builder who seven years ago turned out only about 500 machines a year now is constructing and installing 12,000 a year. The figures contained in the claims of the two latter companies cover but a fraction of the ground, yet are sufficient for illustrating the greater use of knitting machinery.

United States census statistics show that in 1914 there were knitted in the United States 138,630,732 dozens of hosiery, underwear, sweaters, bathing suits, leggings. gloves, shawls, etc., an increase of more than 20 per cent over 1909. No one doubts that in the last four years the increase in knitted production was greater than that for the period from 1909 to 1914. Exports of knitted goods for the eleven months ended November 1914 were valued at $4,225,550, mounting for corresponding periods to $15,-174,306 for 1915; $20,712,946 for 1916; and $13,090,490 for 1917. In the meantime imports fell from $5,381,126 for the 1914 eleven-months period to $510,344 for the corresponding period of 1917 The domestic consumption of sweaters and knitted bathing suits probably has increased by a greater per centum in the last few years than any other of the knitted lines, so that it seems not difficult to reach the conclusion that the consumption of needles has, if anything, outdistanced production.

The increased use of needles is greater proportionately than the additions to equipment, for the reason that more fine gauge machines, requiring more needles, are used than formerly. Furthermore, the life of the latch needle is not so long as when it was possible to obtain suitable steel, and the destruction is greater because of lessened efficiency in every line of textile operation involving the use of the needle.

It is true that considerable of the new machinery displaced obsolete types, but it is also true that much of that which had been set aside as not modern was recalled from the scrap heap and is again in use, so that no estimate of the greater consumption of needles would be even approximately correct unless based on specific information obtained from manufacturers. The fact remains that, while there are stacked up thousands of needles that have fallen into disuse, many manufacturers are gladly taking in needles at from $75 to $90 per 1000 for which, before the war, they paid but $28 to $30, and numbers of machines—1000 in seven mills visited recently—are idle because of lack of needles. The evidence is on the side of an extreme shortage.

Carrier Engineers in Convention.

A convention of the Engineering Staff of the Carrier Engineering Corporation, of New York City, was held at the Hotel McAlpin, at New York, on January 25th and 26th. At this convention about thirty addresses were delivered upon the conditioning of various products, the one on textiles being made by E. T. Lyle. This meeting, which was the first one of its kind, was so successful that similar meetings will be held each year.

THE ENGINEERING STAFF OF THE CARRIER ENGINEE RING CORPORATION AT THE HOTEL MCALPIN, NEW YORK.

While the Carrier Engineering Corporation is but two and a half years old, it has grown so rapidly that it now has an engineering staff of over sixty members, this growth having been a logical outcome of the engineering ability of Willis H. Carrier and J I. Lyle, with the assistance of the able men with whom they have surrounded themselves. Naturally, these meetings allow the various members of the engineering staff to get together and discuss individual problems in open meeting, and inasmuch as this corporation has achieved its success largely through its service cooperation to customers, after as well as before the sale, it is vitally essential that the various members of its staff should be in close personal touch with each other.

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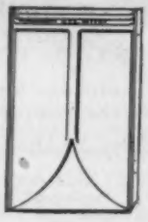

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Workers for the Shipyards.

Because ships are the primary factor in the winning of this war, and because the construction of these ships depends, and will always depend, upon labor, there has been created an organization of workmen known as the United States Shipyard Volunteers, enrolled under the Public Service Reserve. This organization is composed of workmen who are willing to give a good day's work for a good day's pay; workmen who are not asked to sacrifice present positions to rush madly off to shipyards which may not be able to accommodate them for the moment, but who stand ready, when called upon, to do a particular job for a particular wage in a particular place, and who have enrolled themselves in this organization so that when needed they may be readily reached.

The need of the nation is great. The Shipping Board has the money, the housing of men is being arranged for, the yards are being completed and the materials provided. All that now is lacking is the knowledge of the need that will inspire loyal and efficient mechanics to enroll for service in the yards, not in fashion to disrupt the business of the country through the robbing of present industries. On the other hand, it is planned to make a careful selection of men whose places can be filled without hardships, and who when called upon to give up the jobs they now hold will have waiting for them definite positions at definite wages in definite yards.

The following list shows the kind of trades most needed in shipbuilding, and a particular appeal is addressed to men in those occupations to enroll in the Reserve: Acetylene and electrical welders; asbestos workers; blacksmiths, anglesmiths, drop-forge men, flange turners, furnace men; boiler makers, riveters, reamers; carpenters, ship carpenters, dock builders; chippers and calkers; electrical workers, electricians, wiremen, crane operators; foundry workers; laborers, all kinds; loftsmen, template makers, machinists and machine hands, all sorts, helpers; painters, plumbers and pipefitters; sheet-metal workers and coppersmiths; shipfitters; structural iron workers, riveters, erectors, bolters up; other trades, cementers, crane men.

Special-Type Hosiery for Ecuador.

In the Ecuadorian highlands there is a considerable demand for long stockings with feet large enough for men; that is, for persons wearing a No. 7, 8, or 9 shoe. It is usually cold in these high altitudes, and the natives have acquired the habit of wearing long stockings to keep warm. Stockings for this trade should be natural-color cotton or wool and of the cheapest variety. In former years the German mills made an article for sale in this market. A demand for these stockings will probably also be found in Bolivia and Peru. In these countries the stockings of this type are for the most part hand knit.

J. D. Barnhill Incorporated, 110 West 34th street, New York, announce a change of officers as follows: Philip S. Dodd, president; Clayton DuBosque, vice-president and treasurer; and William T. Andrews, secretary and art director.

Lancashire Notes.

(Continued from page 336.)

would be light. A levy of 5s. per thousand spindles over the whole industry would produce £15,000, a levy of 6d. per loom £20,000, a levy of 3d. per bale £50,000, a penny per month per spinning and weaving operative £30,000, and £2 per £10,000 of capital at least £30,000. Or take a typical mill. An 80,000-spindle mill spinning 60's twist £27, of a penny per operative per month £10 and of £2 per £10,000 of capital £20. If every one of these levies were made the total would be only £78, whereas the annual cost of fire insurance, National Health Insurance and Employers' Liability on a mill of that character would be at from Egyptian cotton would employ approximately 210 persons, use about 2,200 bales a year and might have a capital of £100,000. In the case of such a mill a levy of 5s. per 1,000 spindles would produce £20, of 3d. per bale least £475. It is an instructive comparison, especially when it is remembered that the figures are put much above what would be necessary for a proper start to be made.

The committee do not lose sight of the fact that, if the best value is to be obtained from the promotion of research, the provision for research must go hand-in-hand with better facilities for general education, so that the mental and moral equipment of all grades of workers may be improved and they may be made fit to take full advantage of scientific discovery. It is claimed that the result of such a policy of linking science with the industry would be "to banish the vague and constant dread of being ousted from the world's markets by foreign rivals. It will enable the trade to face competition fearlessly, because it will then be firmly and solidly based on knowledge."

The reception that is being accorded to such views as the foregoing is quite different from what it would have been four years ago. Lancashire cotton men have tended far too much in the past to despise theory and regard it as being divorced from the practical affairs of life. "Book-learning" and science they have looked upon rather as impedimenta. The "rule of thumb" has found too much favor. But war works wonders.

Removal Notice.

The C. W. Hunt Company, Inc., have announced that inasmuch as the United States Government has taken over for its own use the entire building at 45 Broadway, New York, where their New York offices have been located, that on February 14th they moved these offices to the Astor Trust Building at 501 Fifth Avenue Corner of 42nd. Street.

Japan Hosiery Exporters' Associated Guild will undertake by standardizing to ensure quality of all Japanese exports of hosiery; the trade has grown from $4,985,000 in 1913 to $16,450,500 in 1916.

"Chain driven motor trucks and tractors" is the title of a 14 page illustrated booklet recently published by the Link-Belt Company, 39th Street & Stewart Ave., Chicago, Ill. This publication is known as No. 359 and contains much of interest to the man with a chain driven motor truck.

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